

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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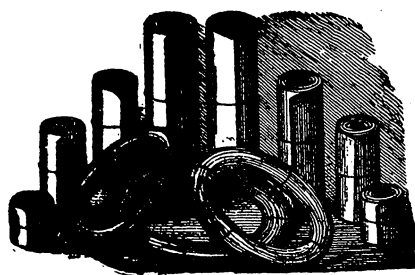
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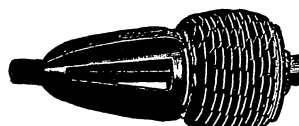
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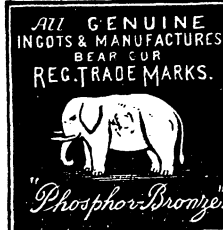
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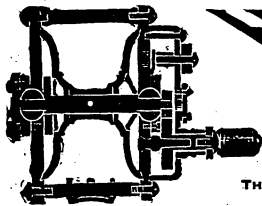
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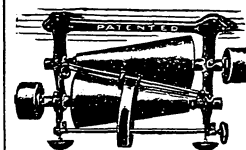
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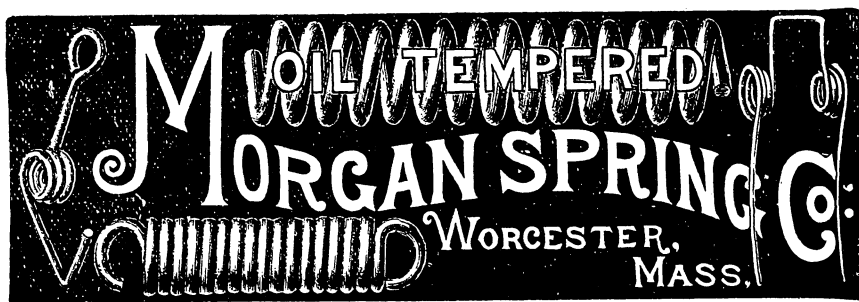
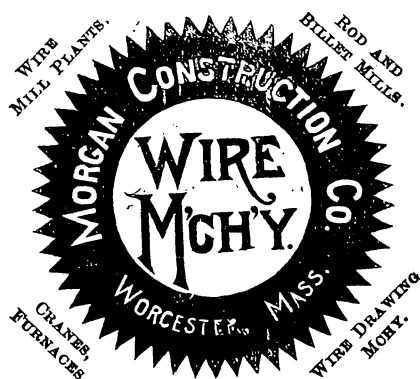
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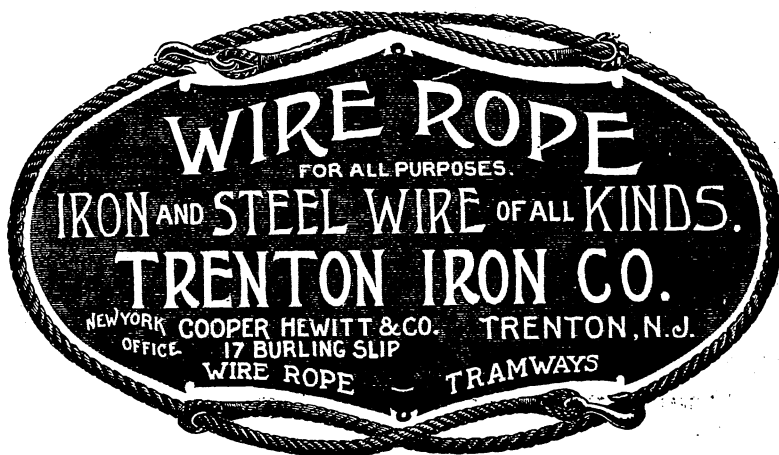
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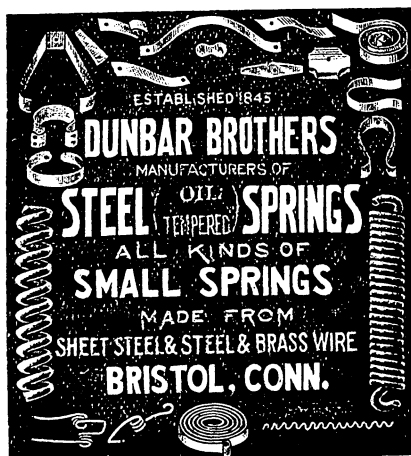


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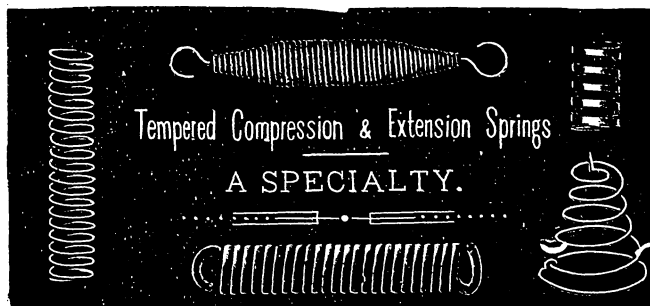
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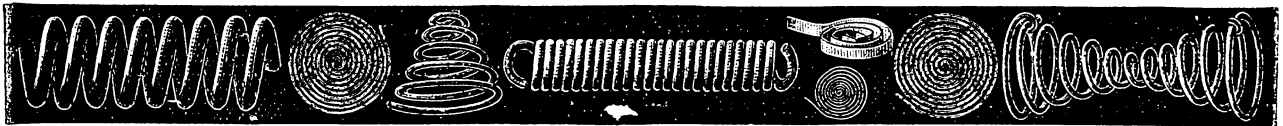


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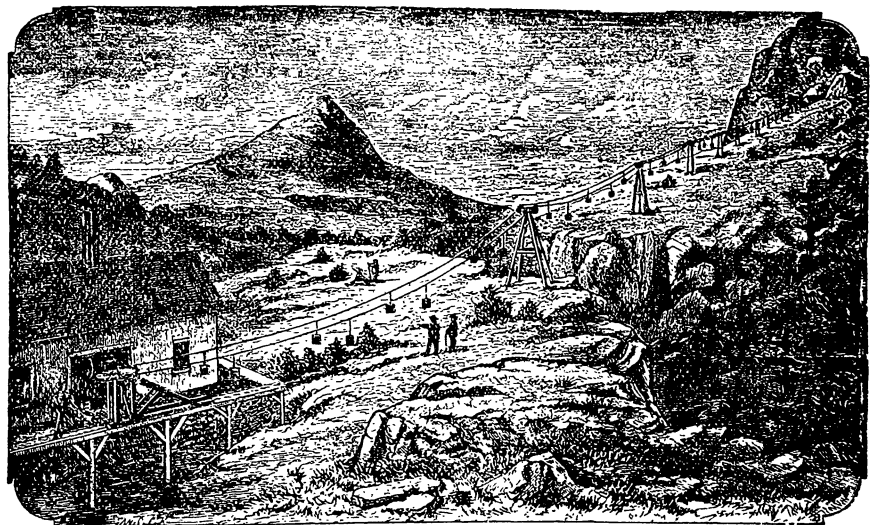
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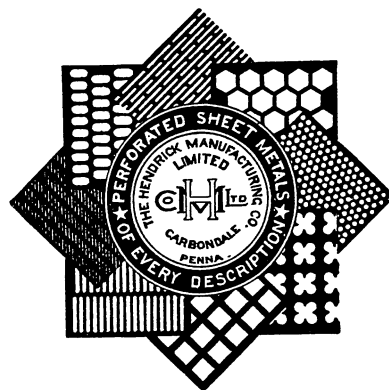
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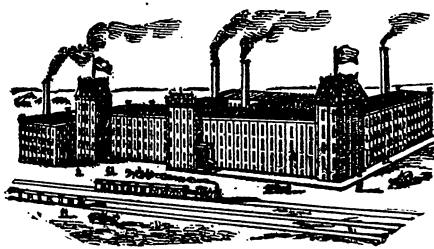
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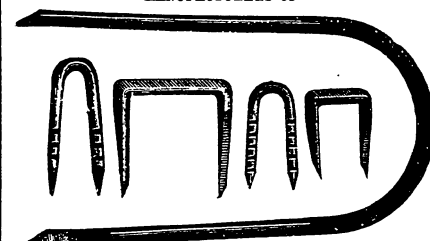
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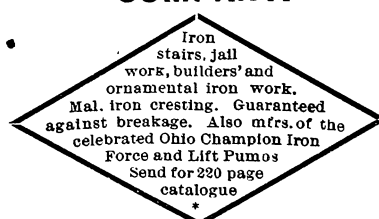
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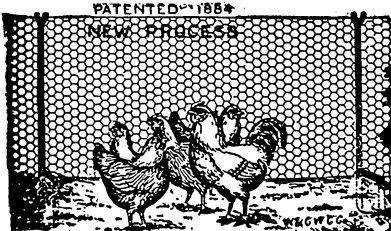
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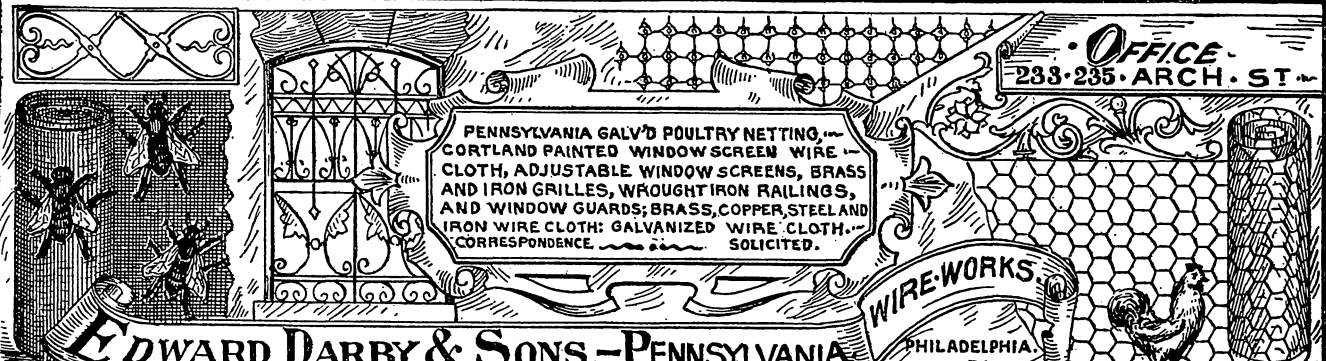
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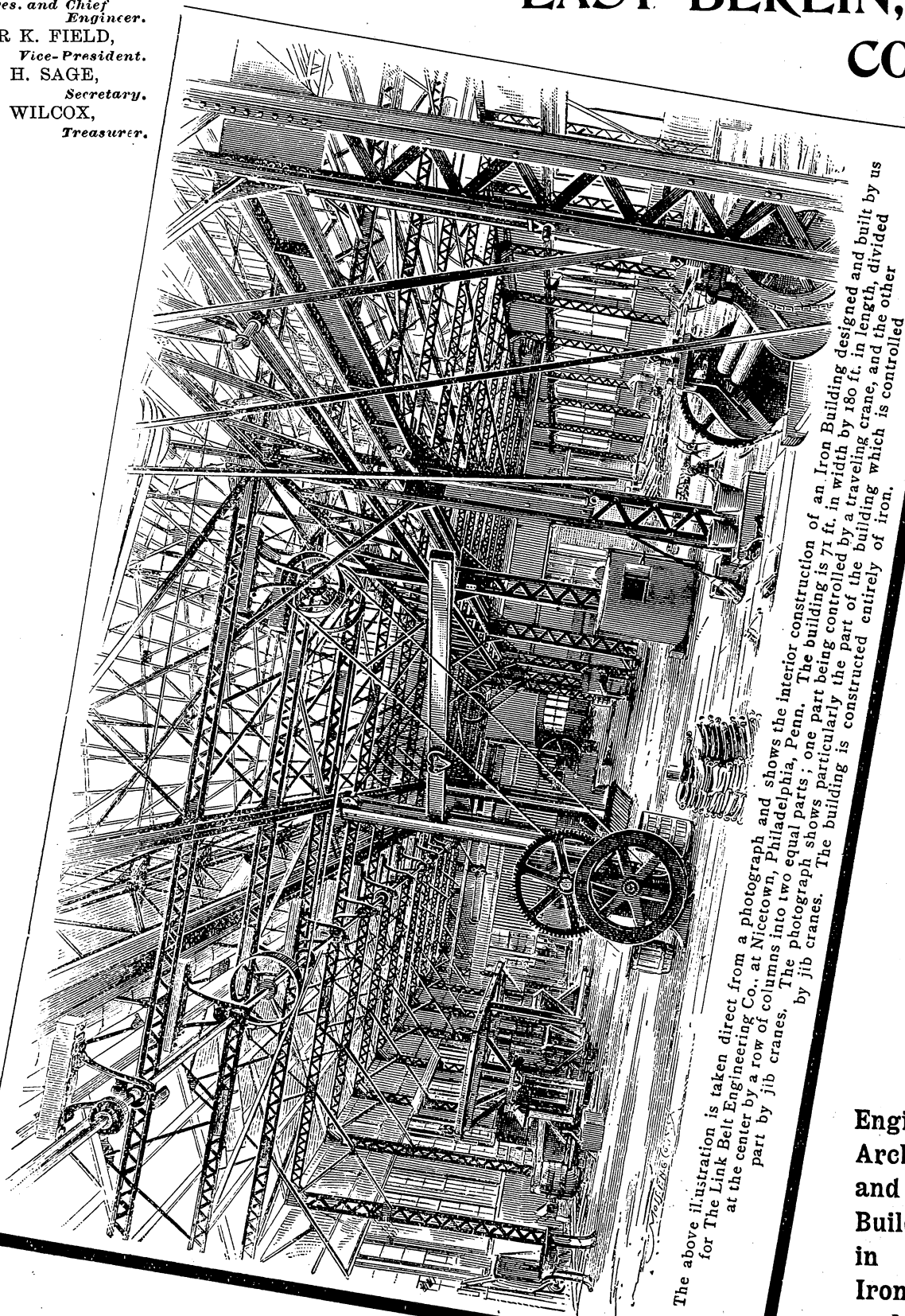
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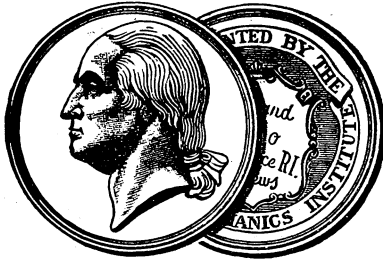
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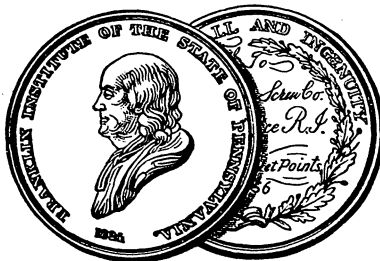
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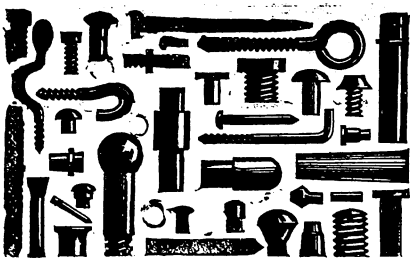
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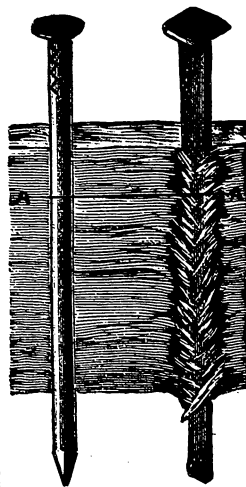
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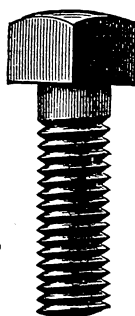
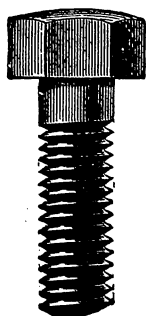
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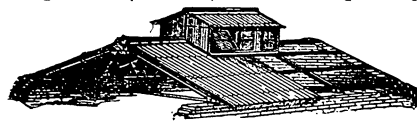


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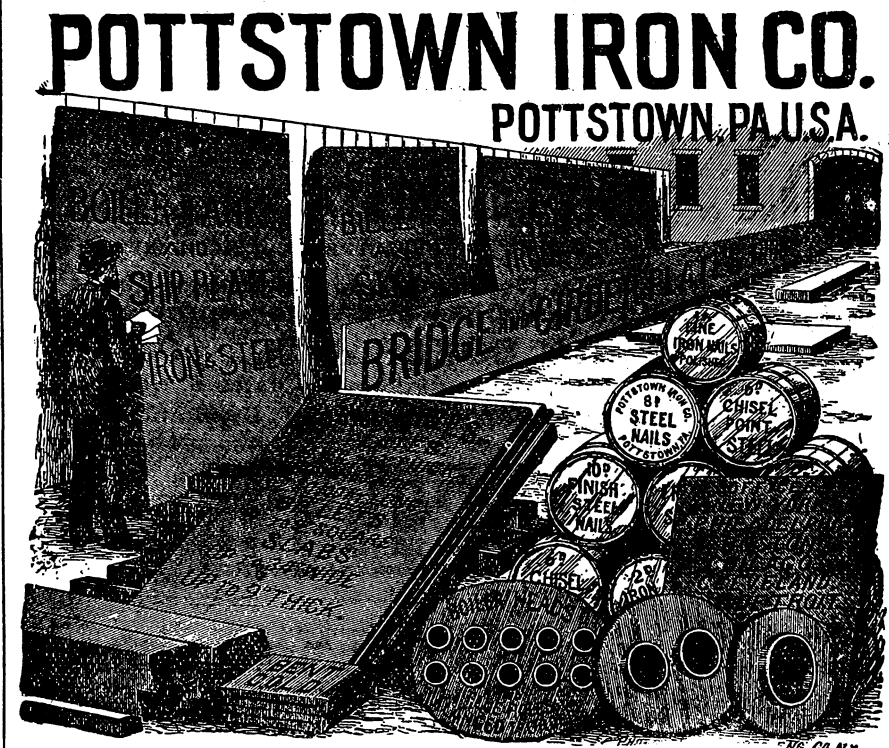
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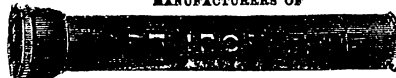
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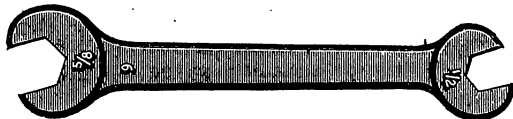
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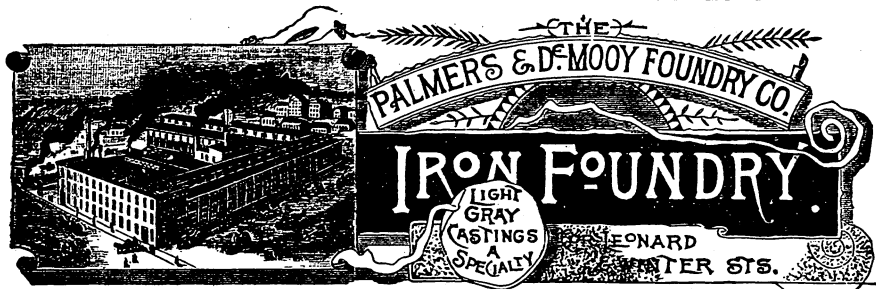
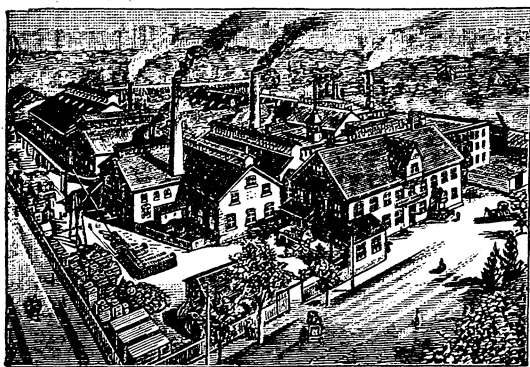
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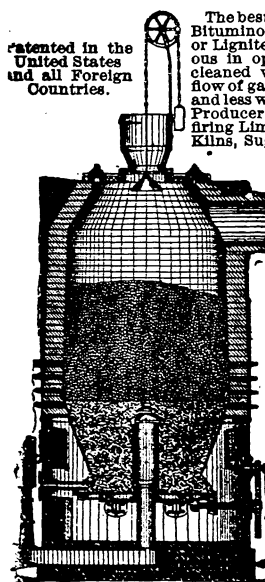
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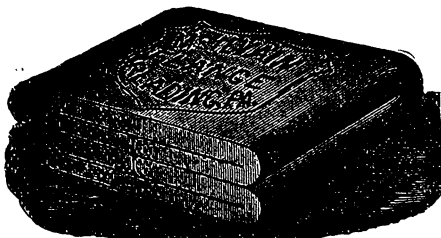
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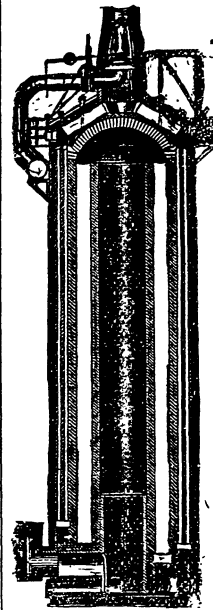
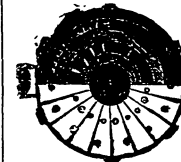
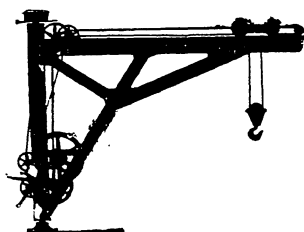
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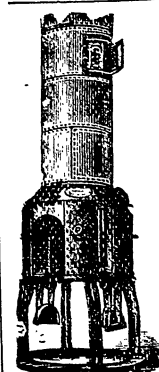
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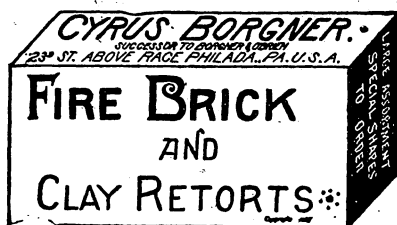
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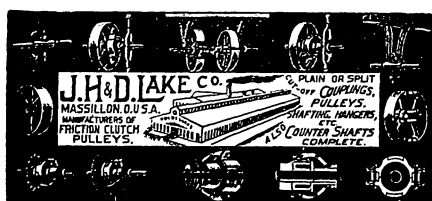
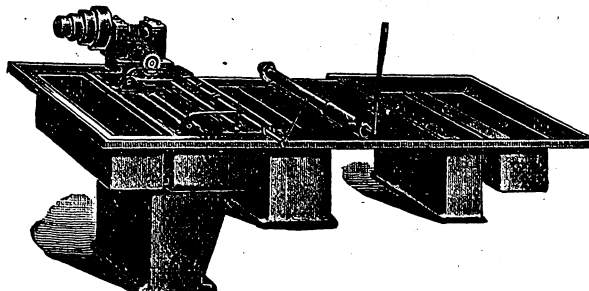
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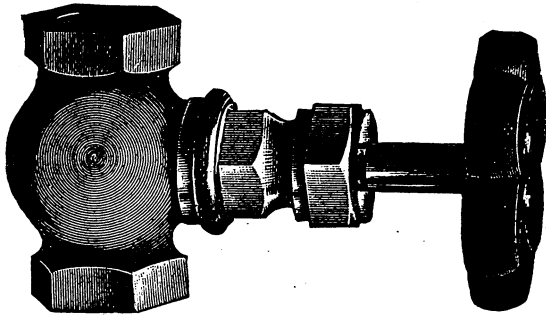
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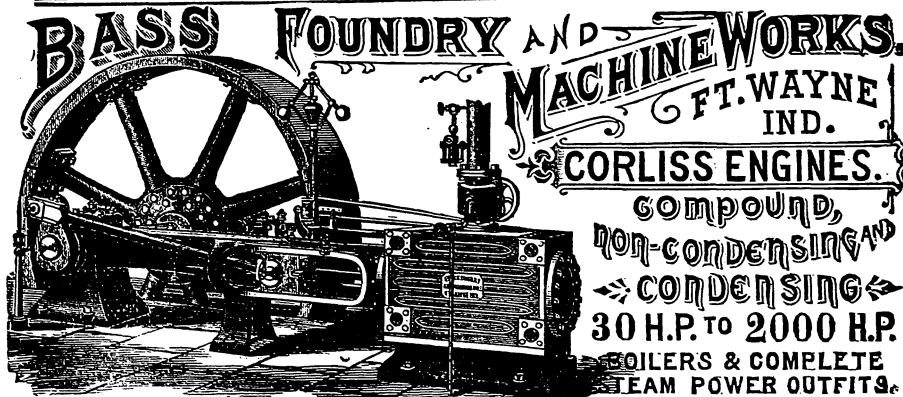
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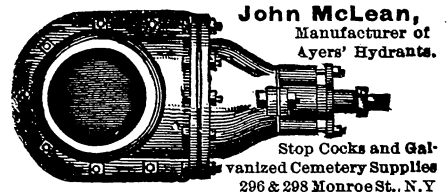
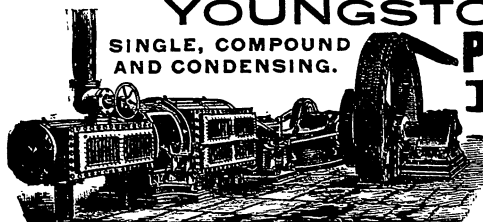
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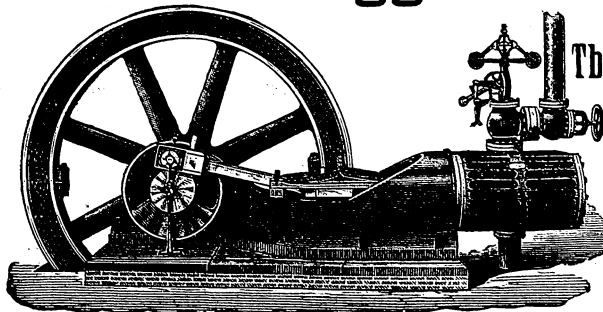
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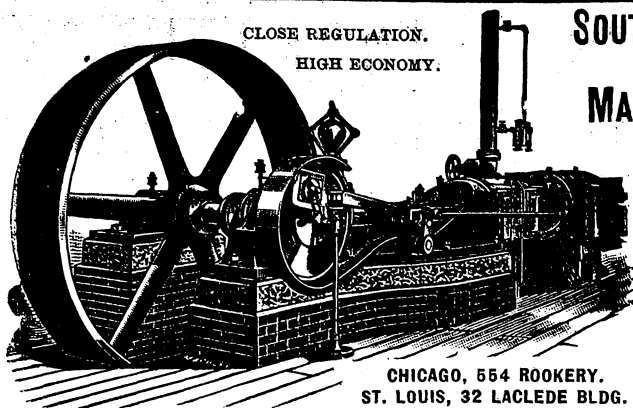
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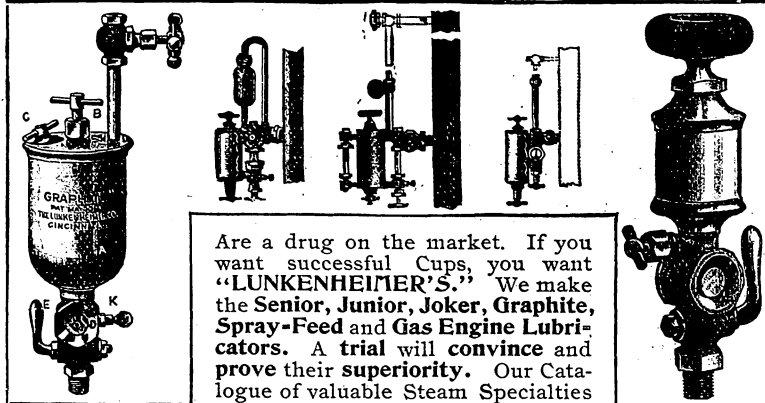
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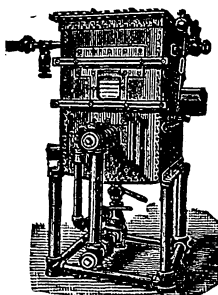
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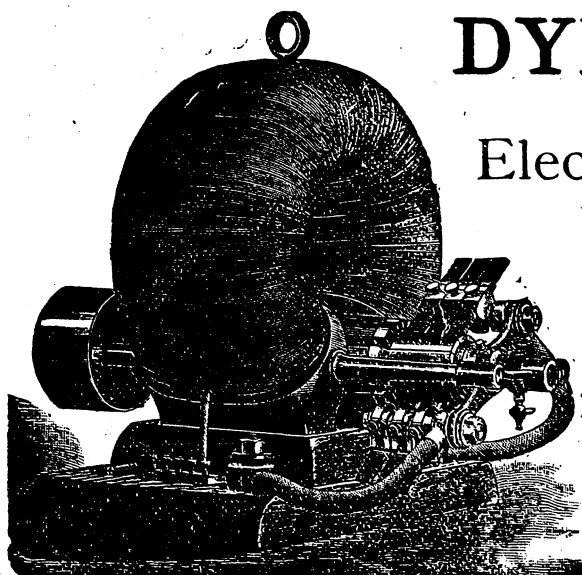
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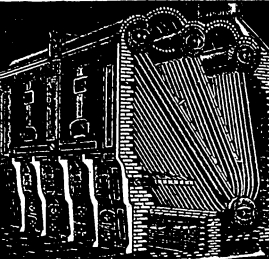
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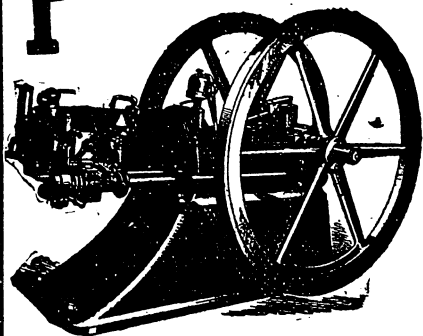
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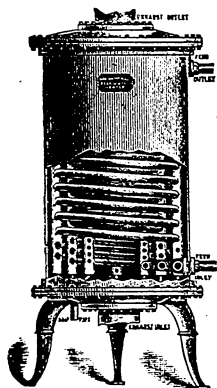
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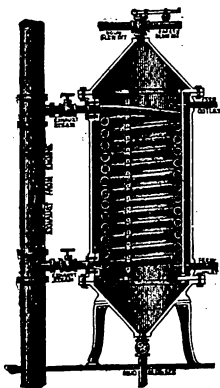
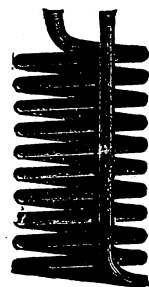


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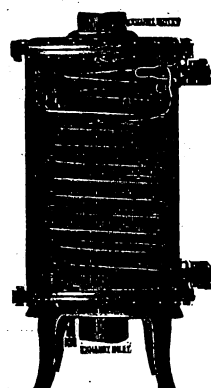
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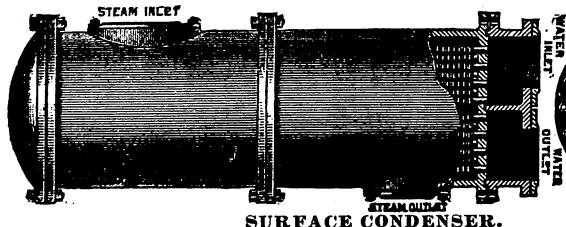
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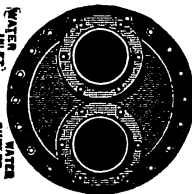
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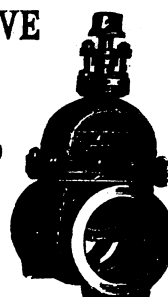
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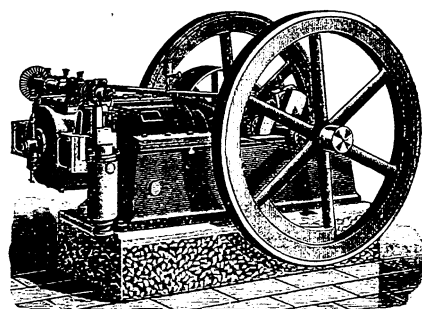
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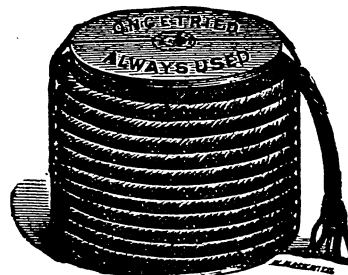


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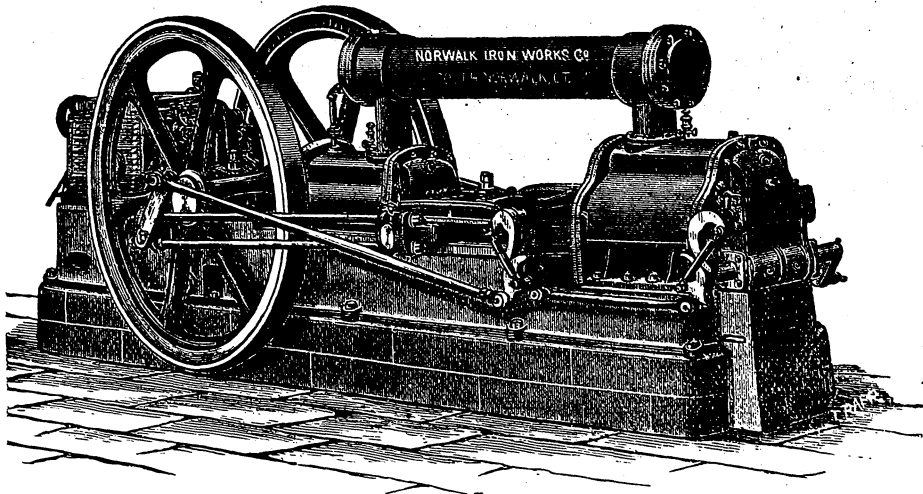
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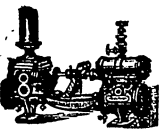
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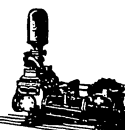
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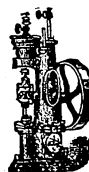
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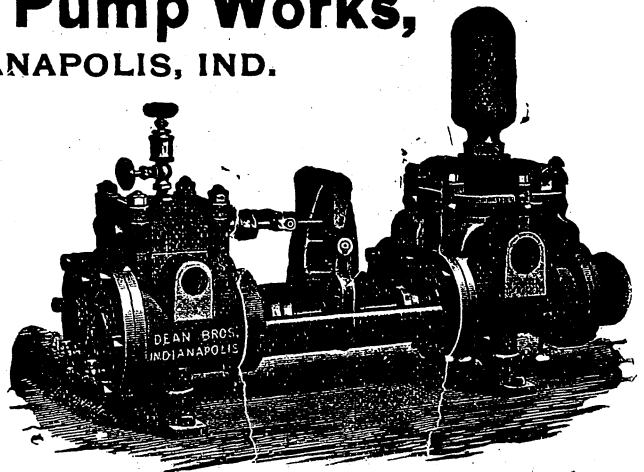
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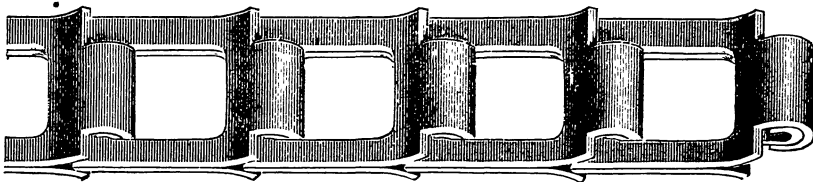
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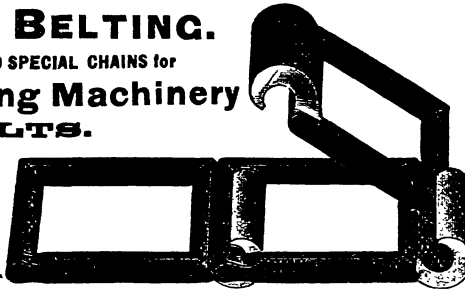
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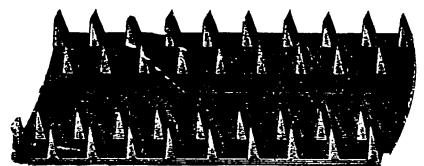
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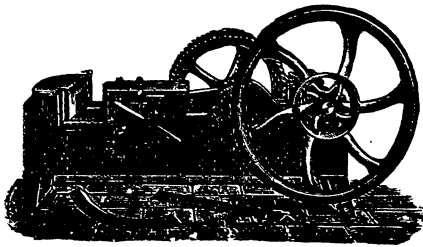
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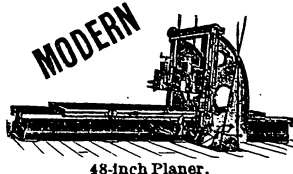
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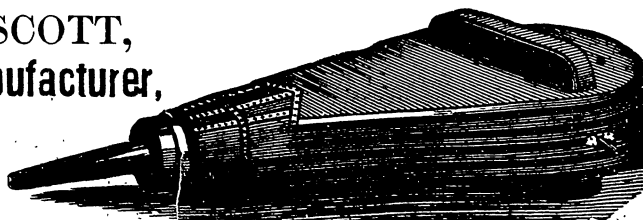
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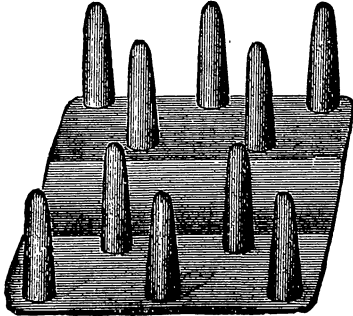
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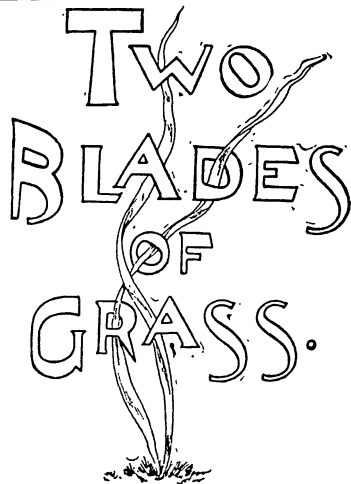
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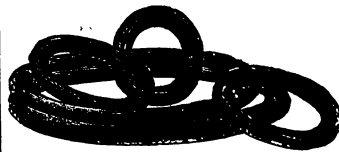
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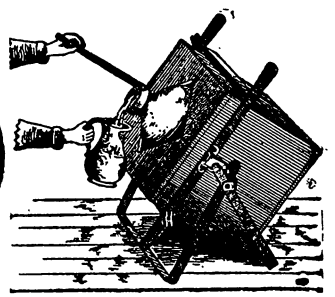
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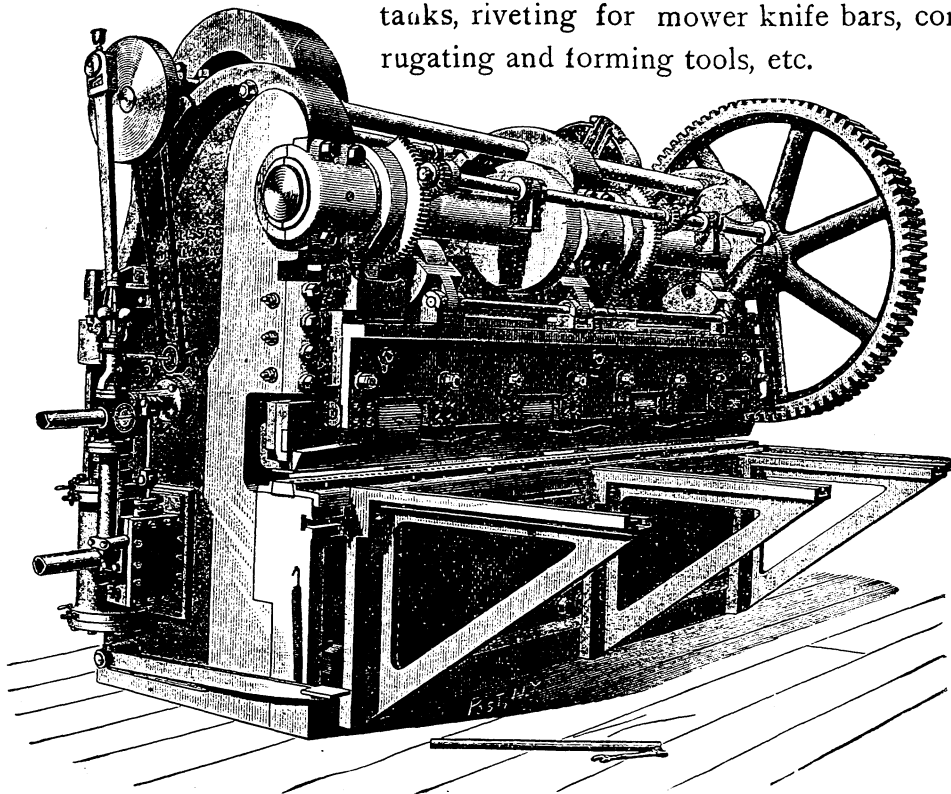
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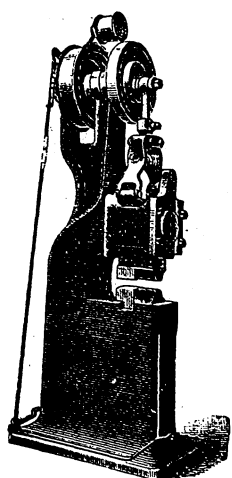


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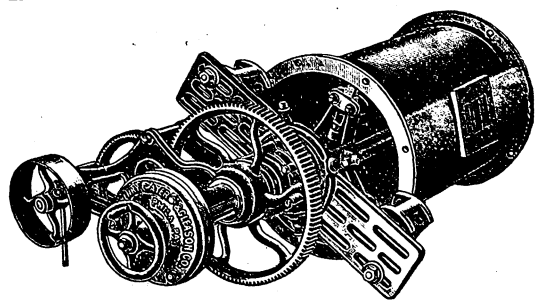
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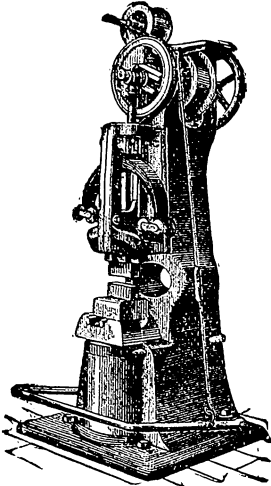
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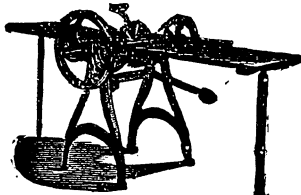
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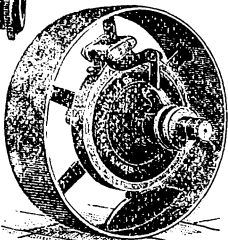
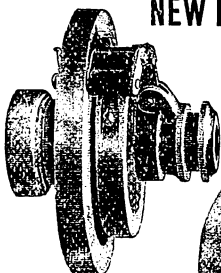
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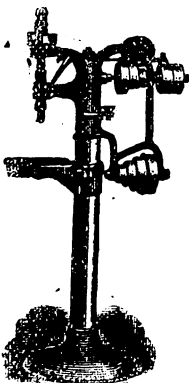
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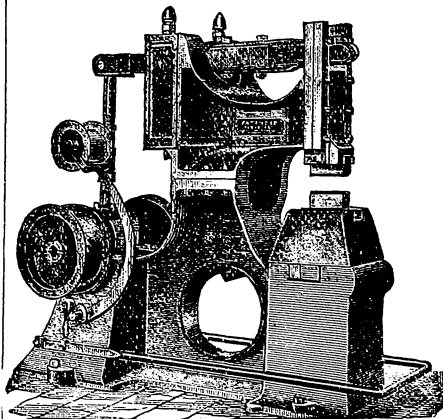
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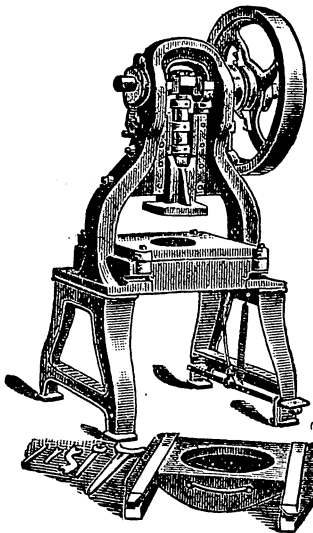
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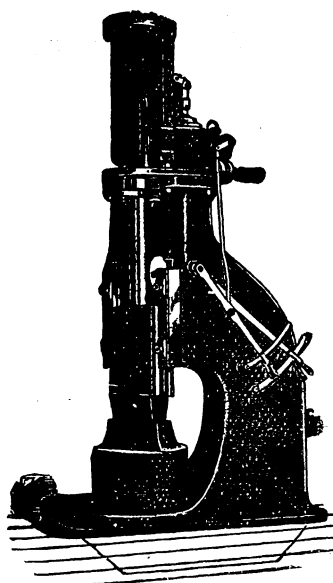
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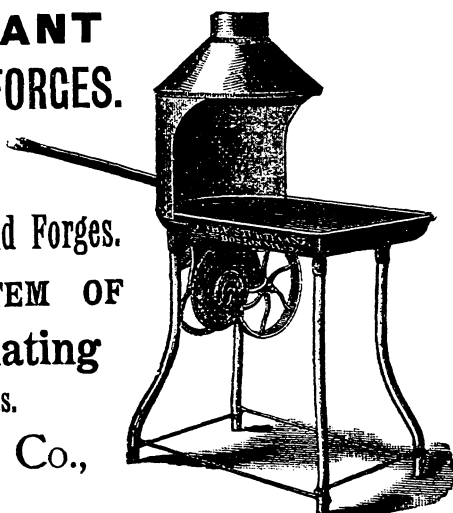
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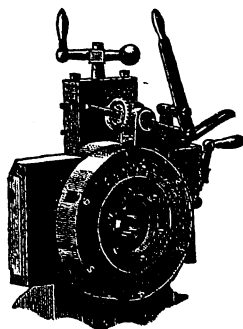
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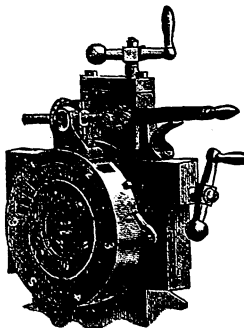
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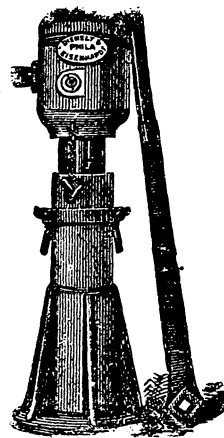
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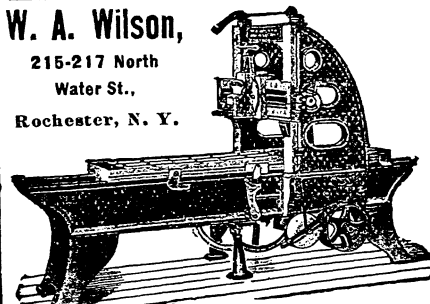
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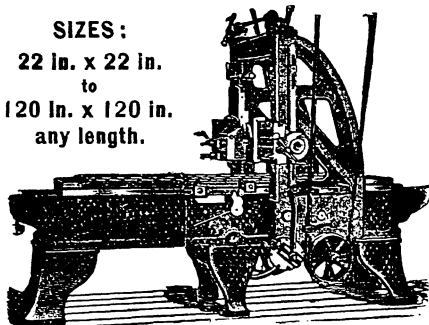
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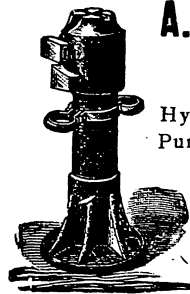
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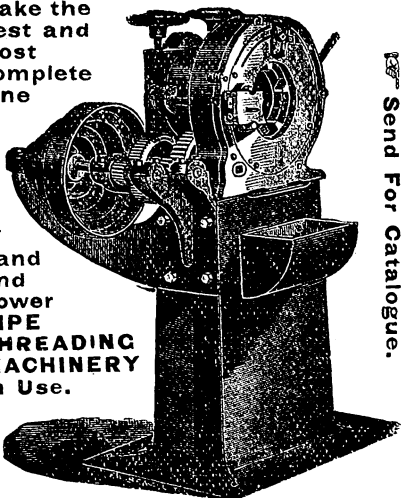
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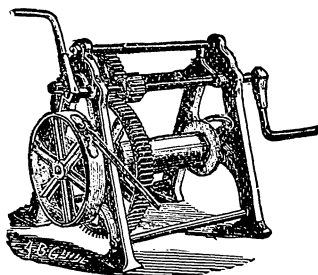


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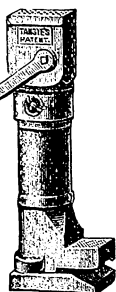
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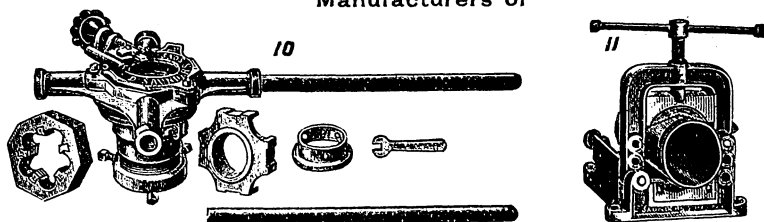
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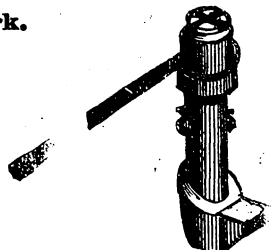
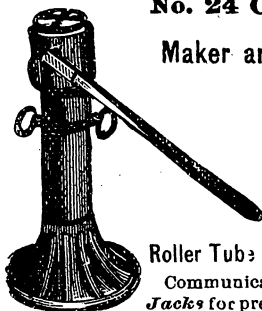
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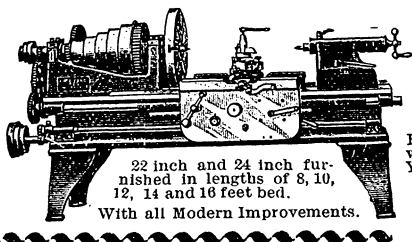
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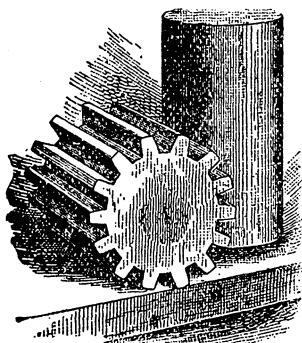
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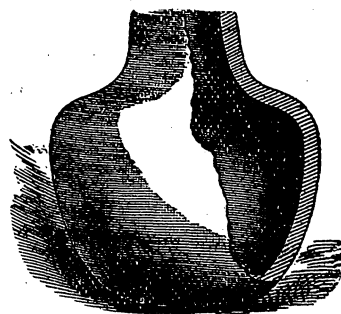
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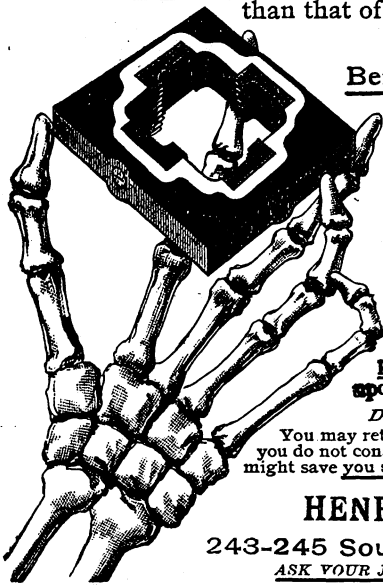
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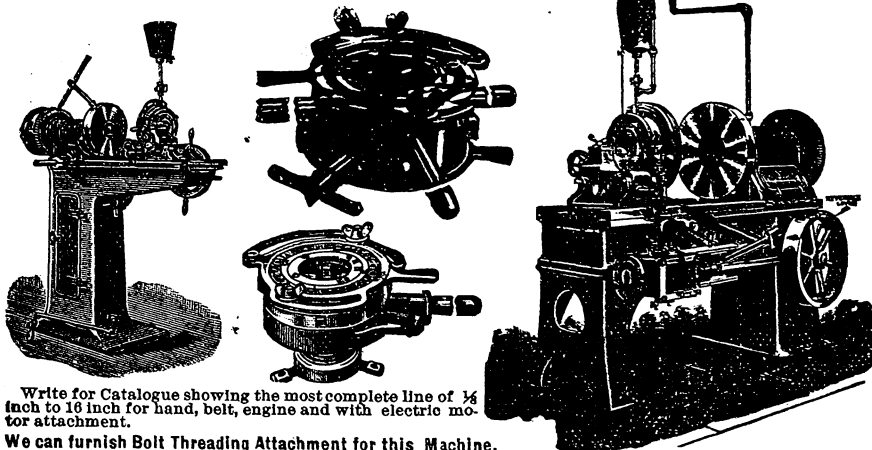
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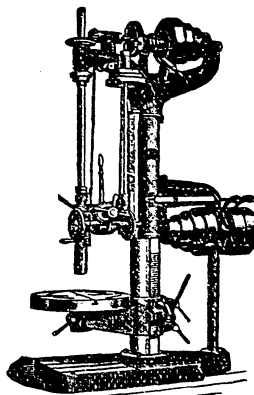
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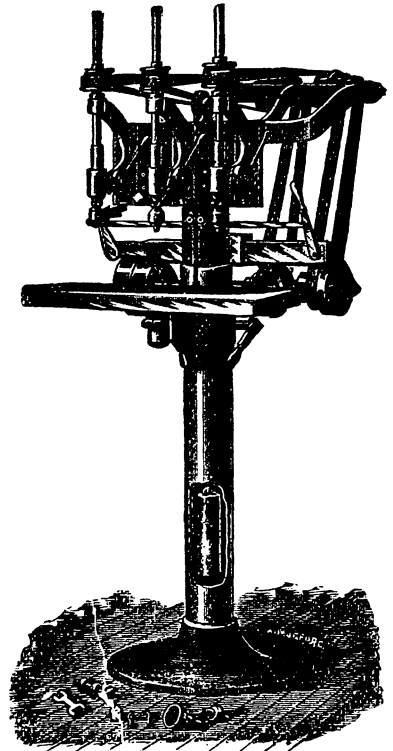
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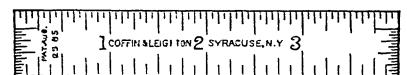
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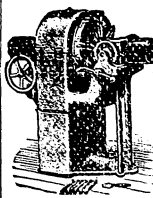
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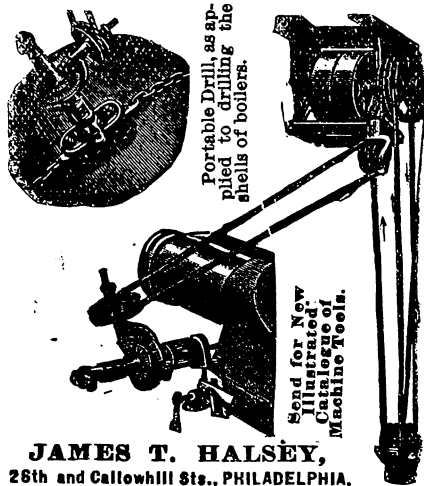
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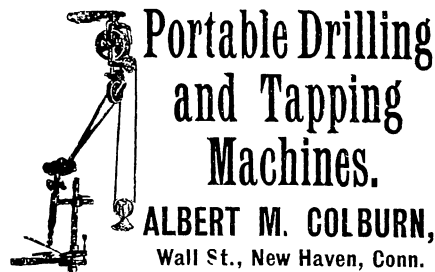
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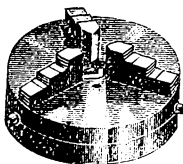
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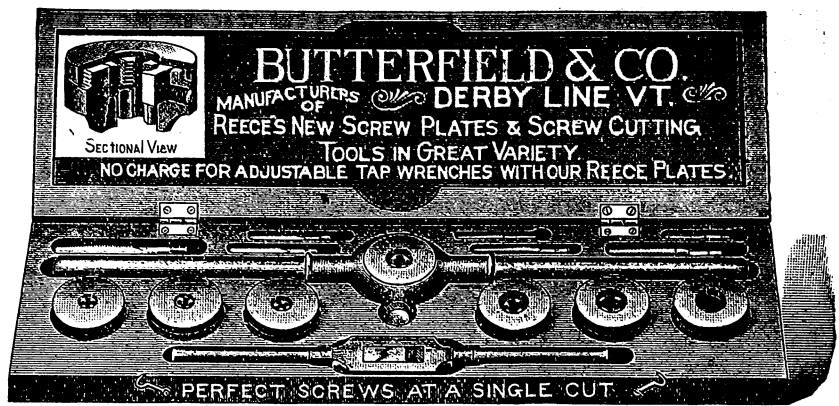
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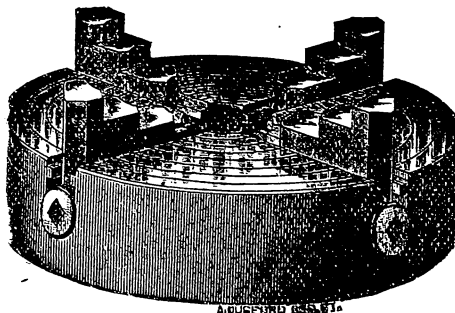
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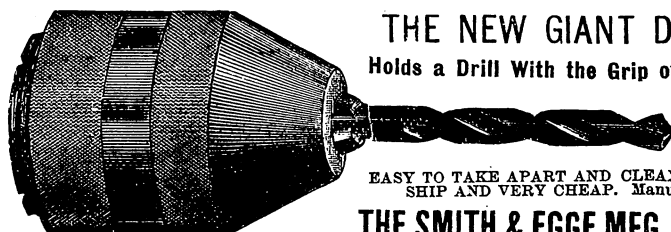
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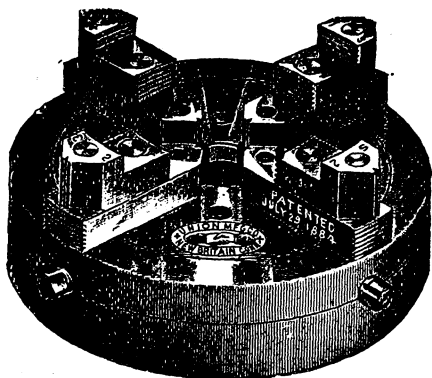
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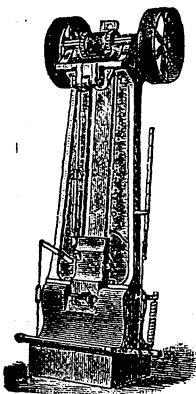
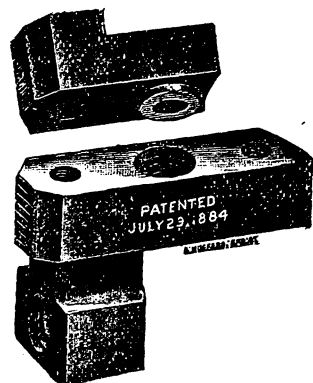
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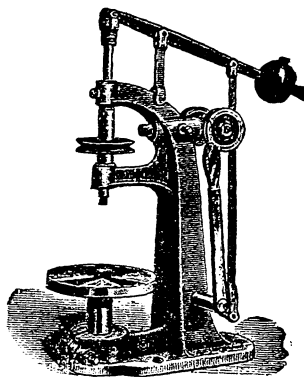
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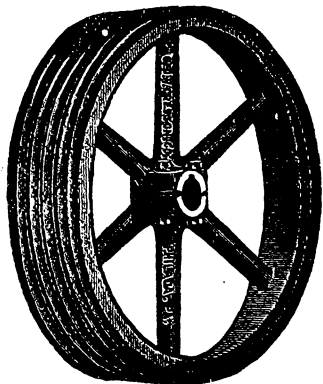
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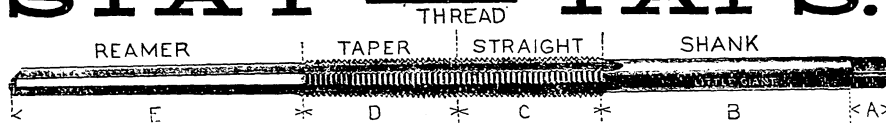
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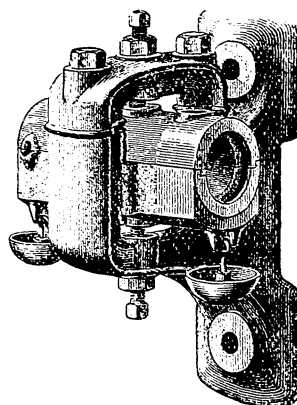
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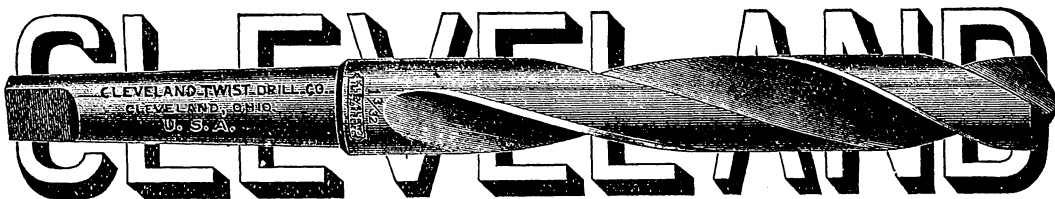
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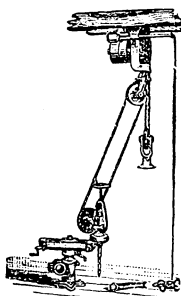
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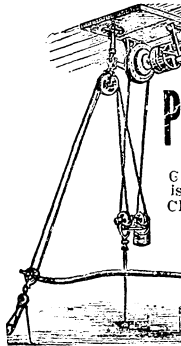
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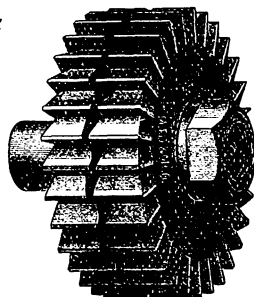
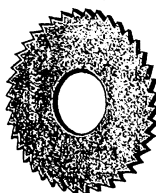
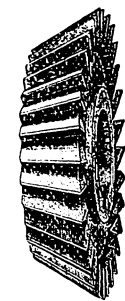
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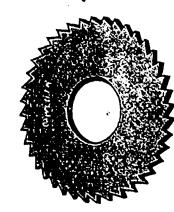
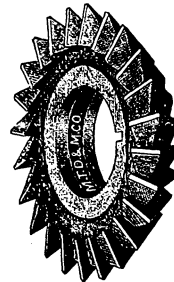
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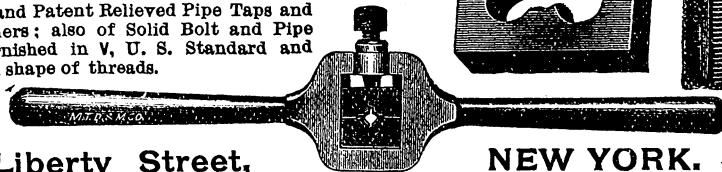
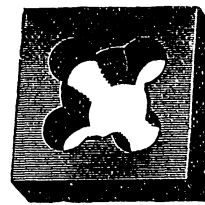


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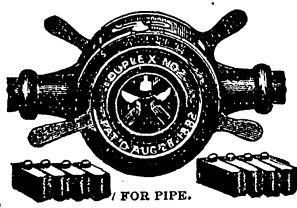


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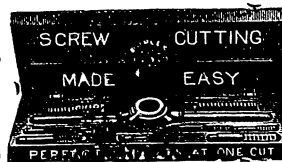
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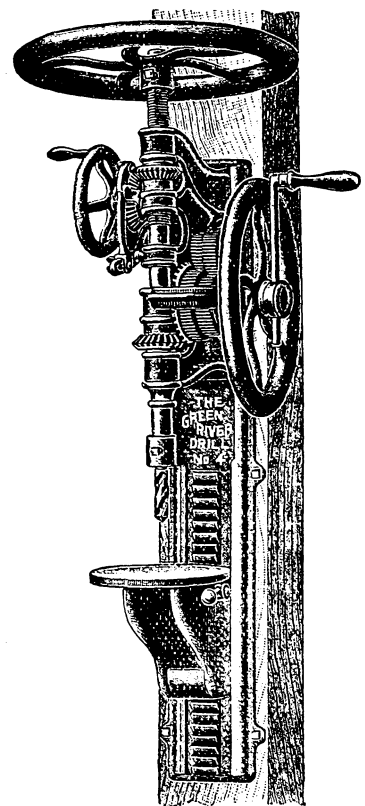
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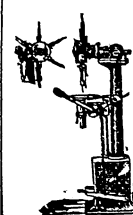
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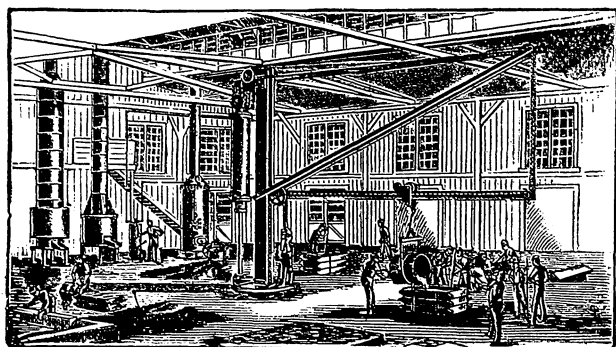


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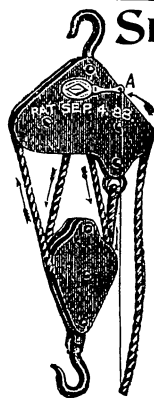
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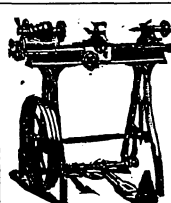
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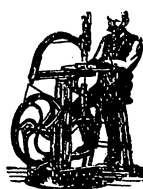
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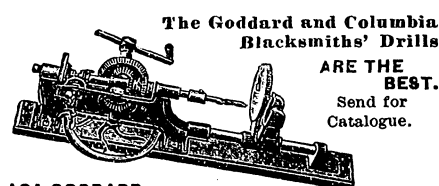
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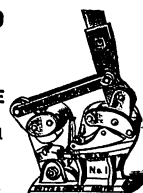
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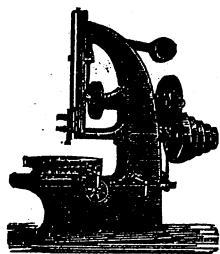
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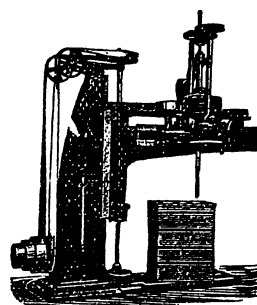
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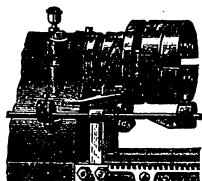
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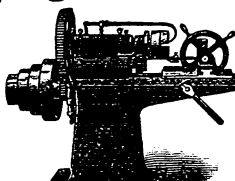
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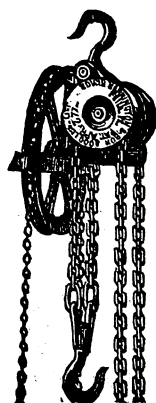
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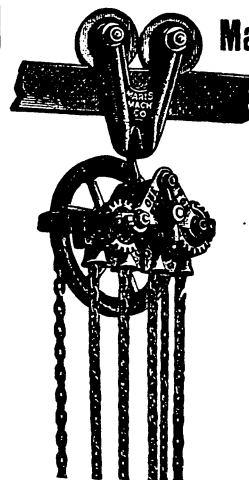
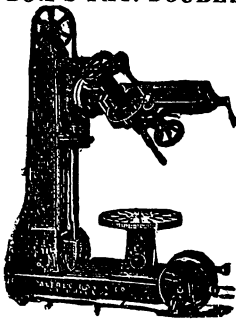
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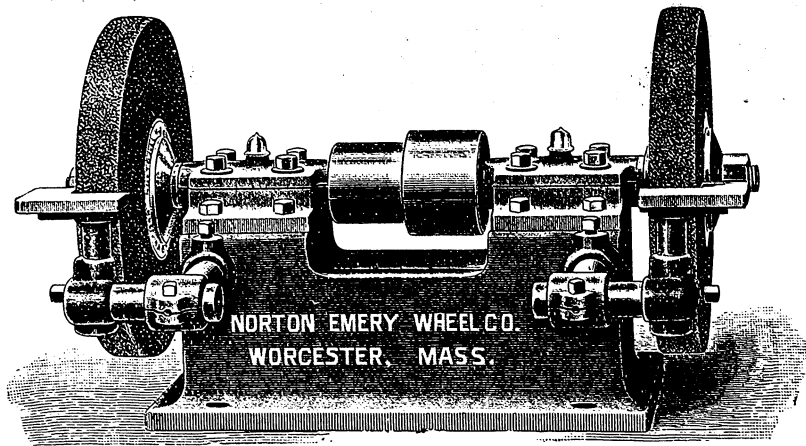
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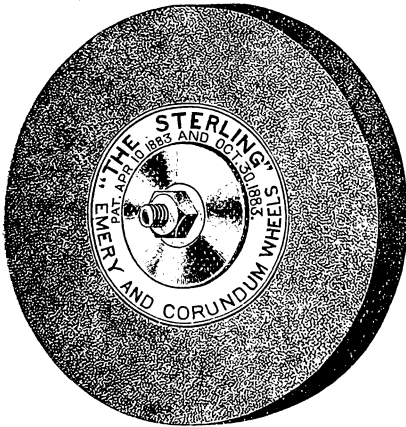
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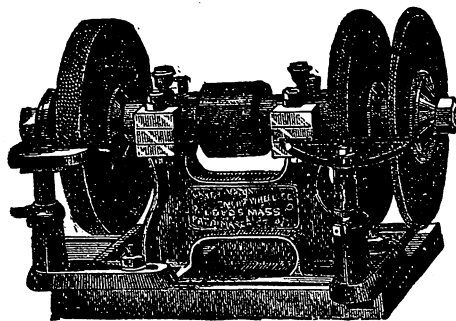
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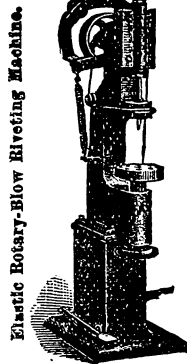
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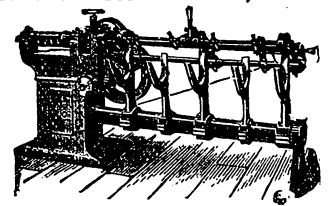
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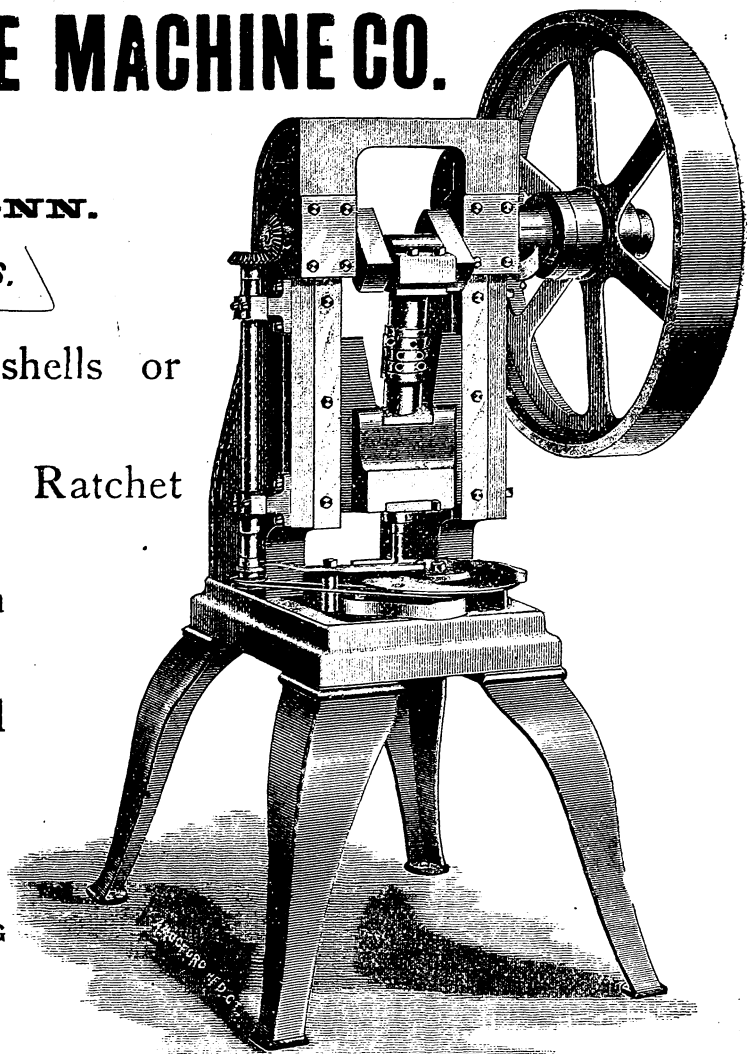
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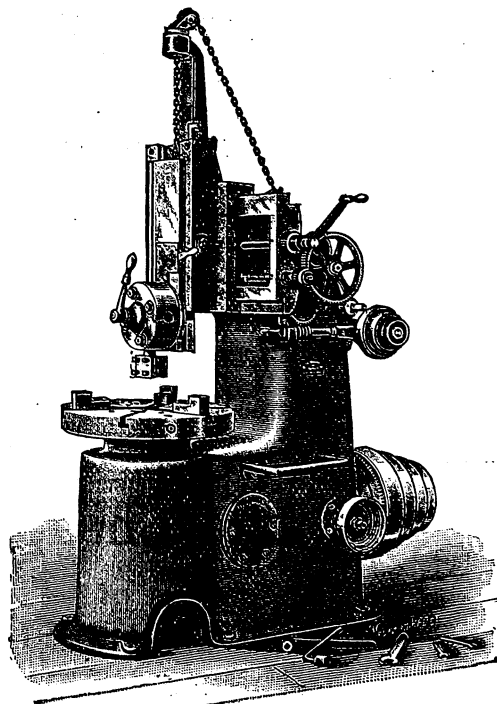
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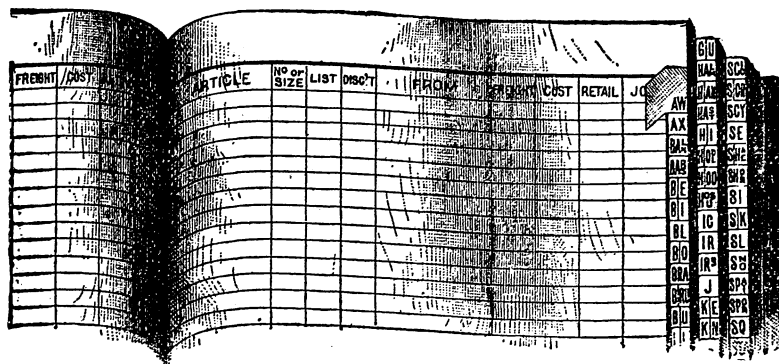
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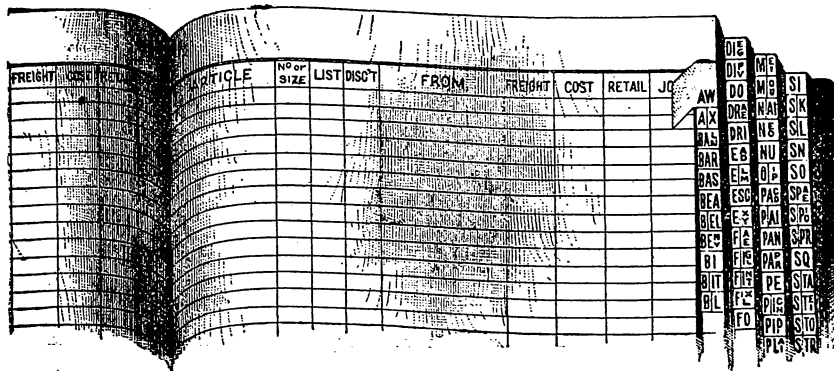
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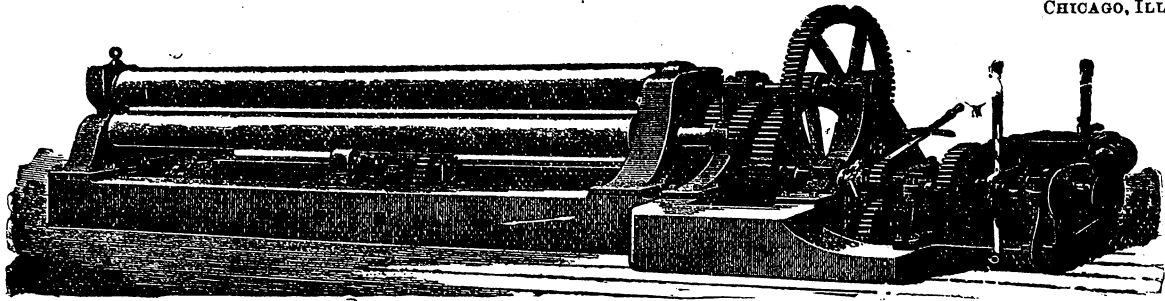
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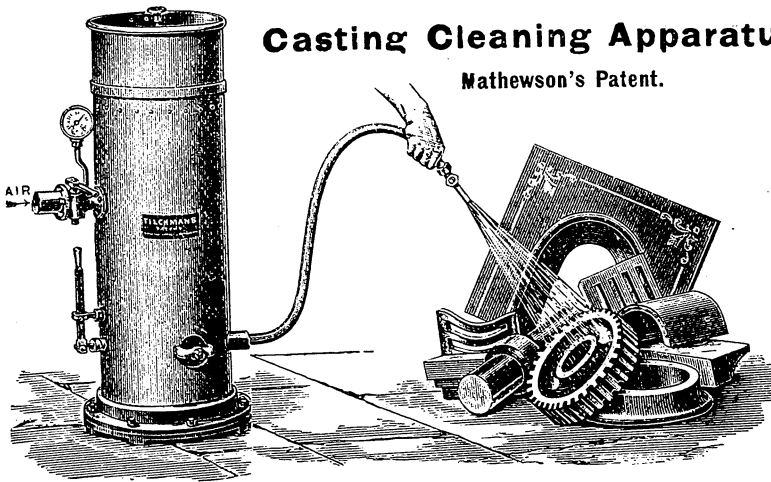
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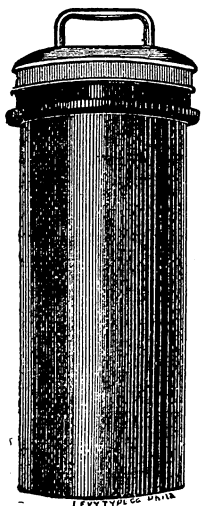


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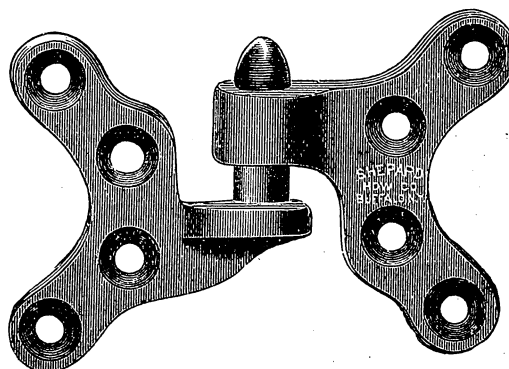
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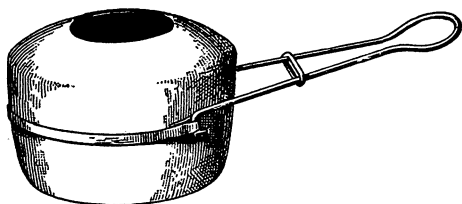


Fig. 108.—Clamp for Holding Tea Kettle while Being Tinned.

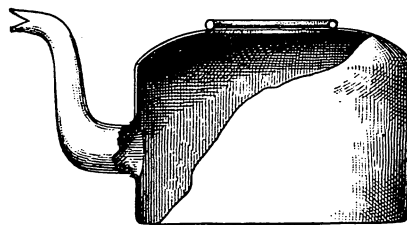


Fig. 110.—Tea-Kettle, Showing Spout Attached.

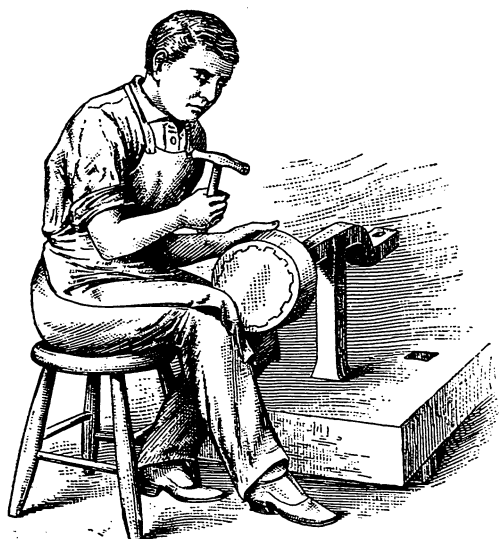


Fig. 107.—Planishing Tea Kettle Side.

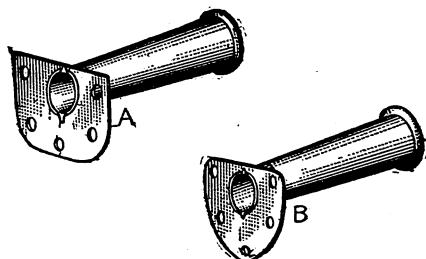


Fig. 54.—Way to Put the Flaps On.

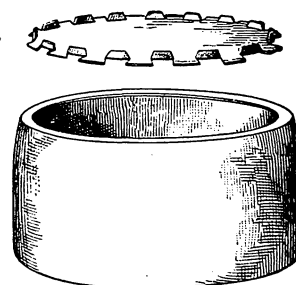


Fig. 105.—Putting in Bottom.

The above are Specimen Illustrations from "The Art of Coppersmithing," and indicate the Practical Nature of the Treatise, and how it Goes into All the Details of Workmanship.

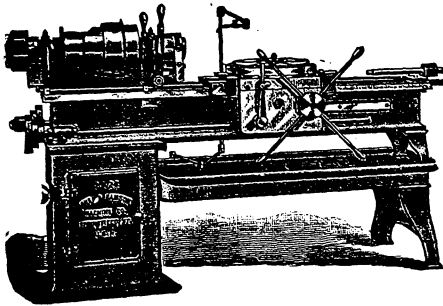
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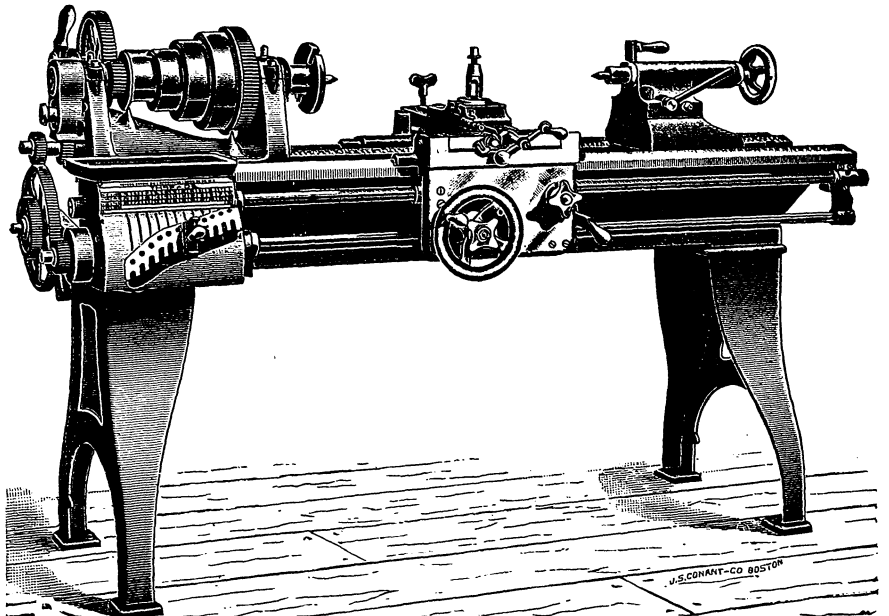
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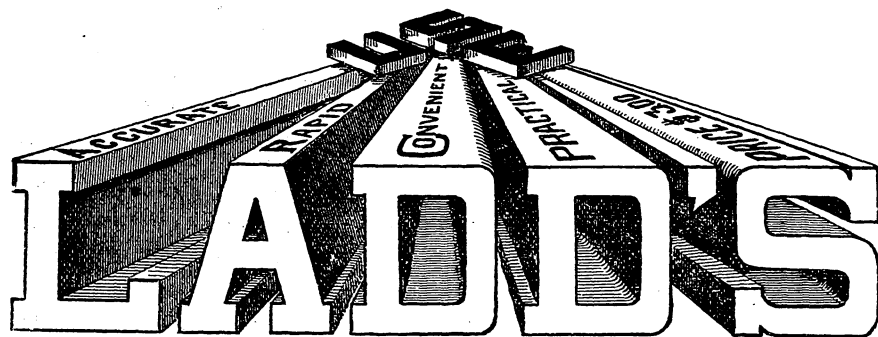


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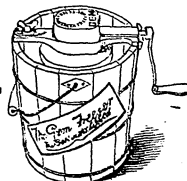
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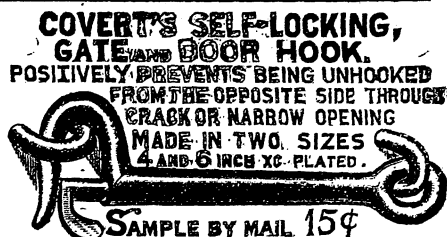


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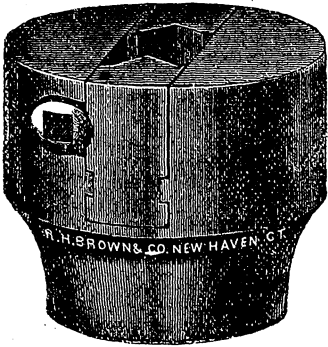
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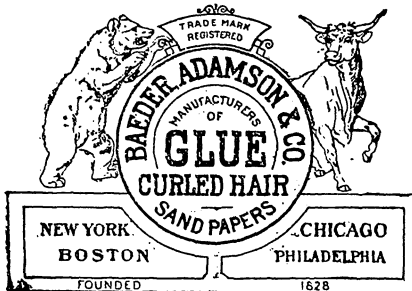


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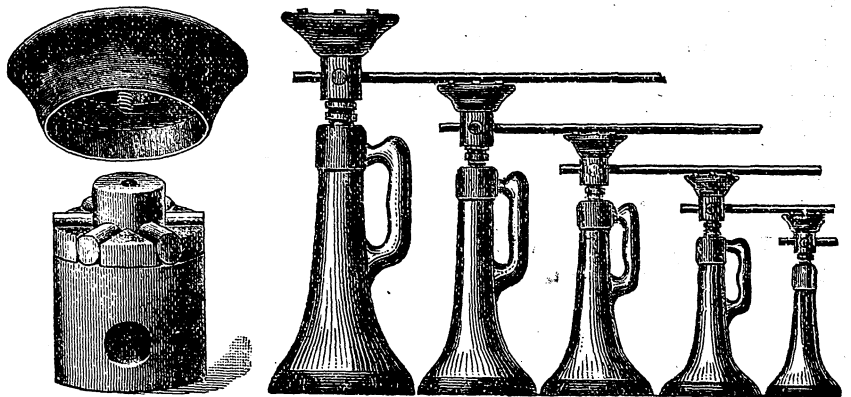


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Handle and Blade Formed in one piece.
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Equal to the best Gas Light.
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Will Burn Four Hours for One Cent.

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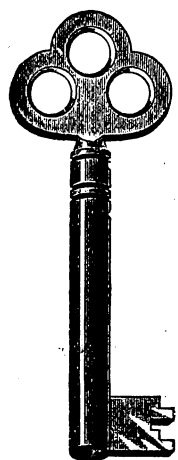
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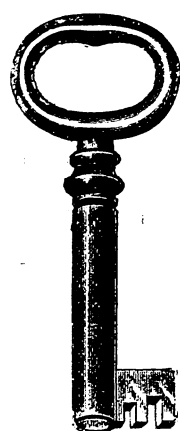
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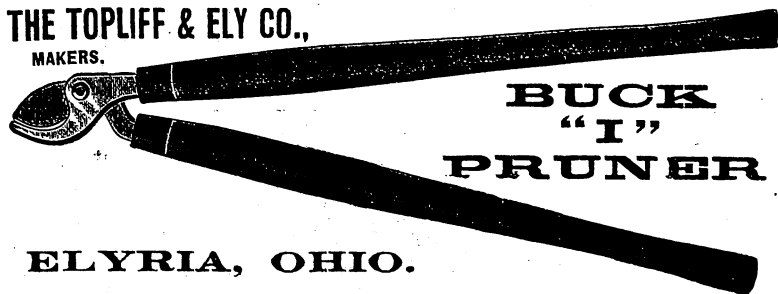
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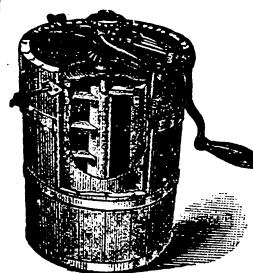
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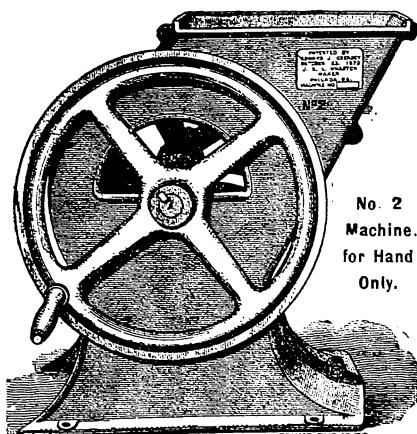
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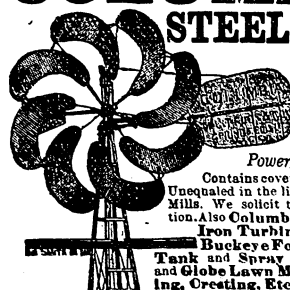
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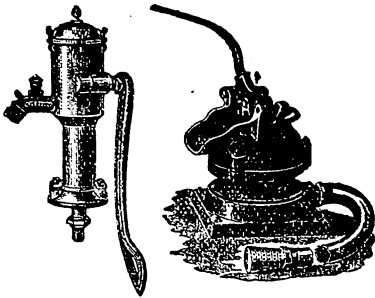
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Fig. 381.

Fig. 145.



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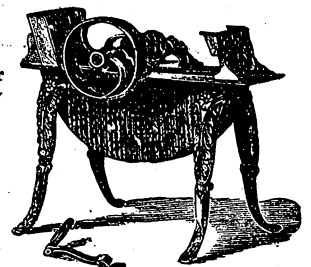
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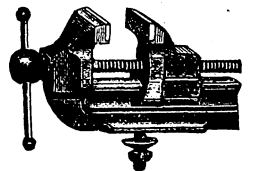
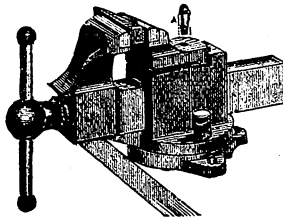
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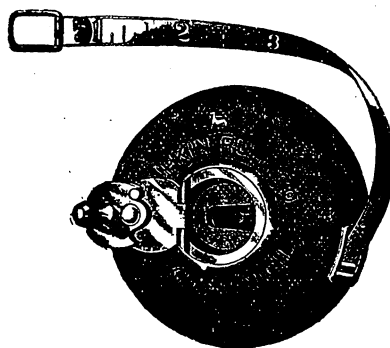


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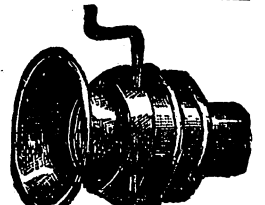
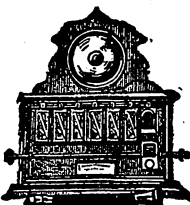
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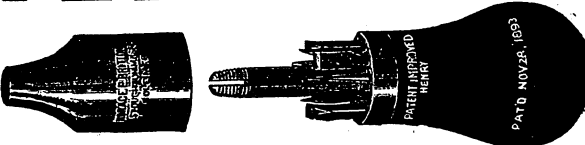
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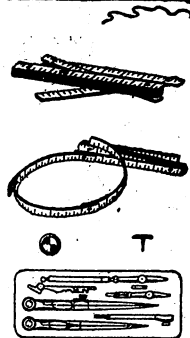
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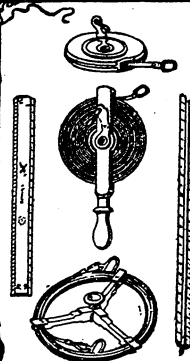


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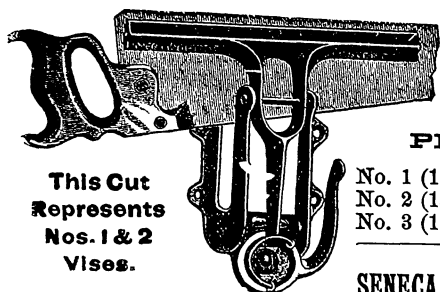
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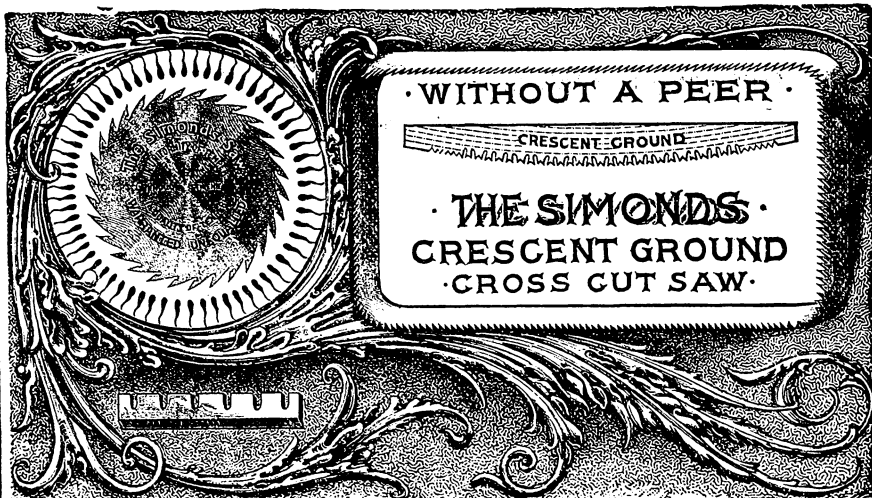
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Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

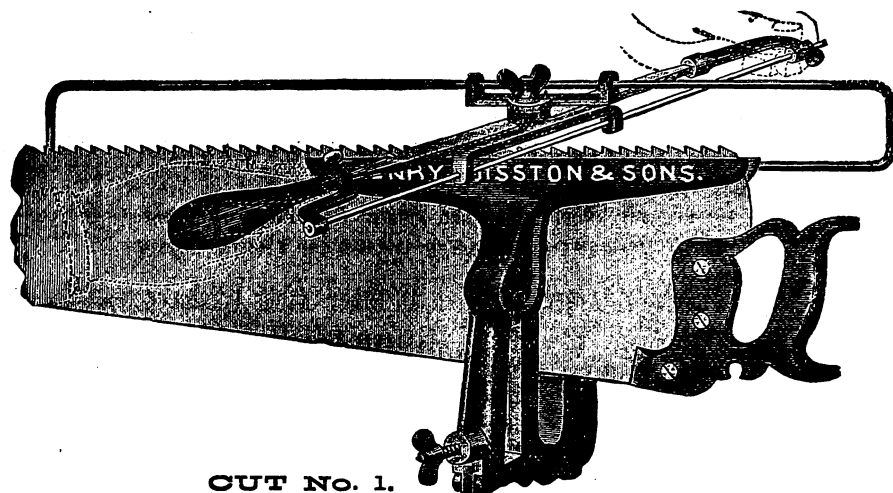
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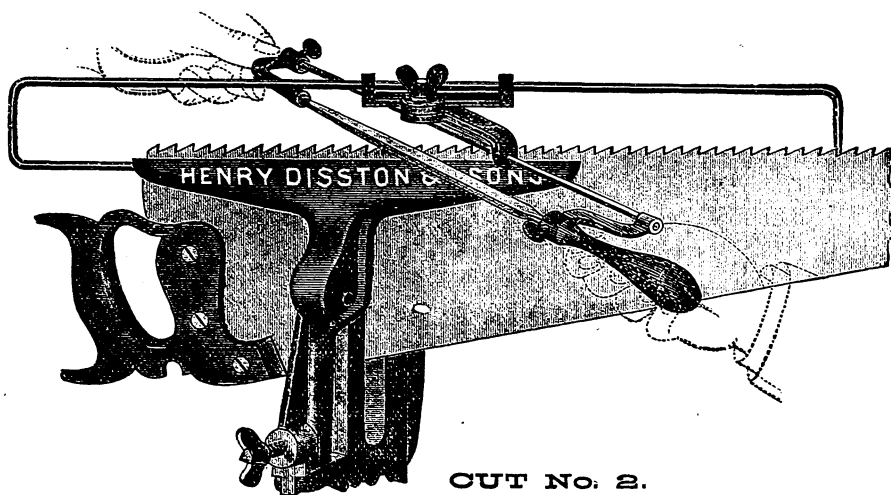
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ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
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Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

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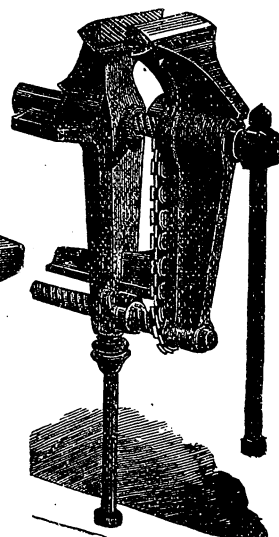
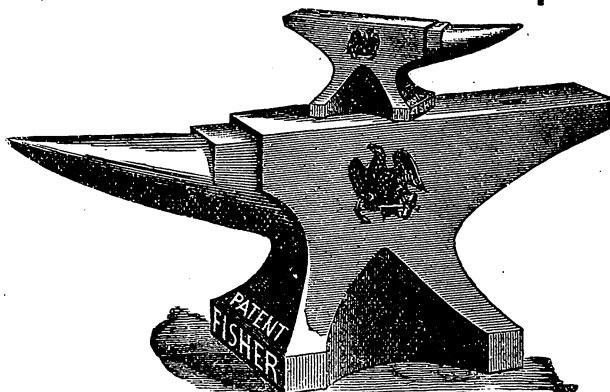
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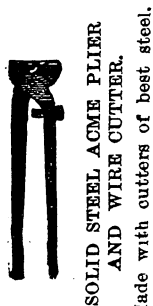
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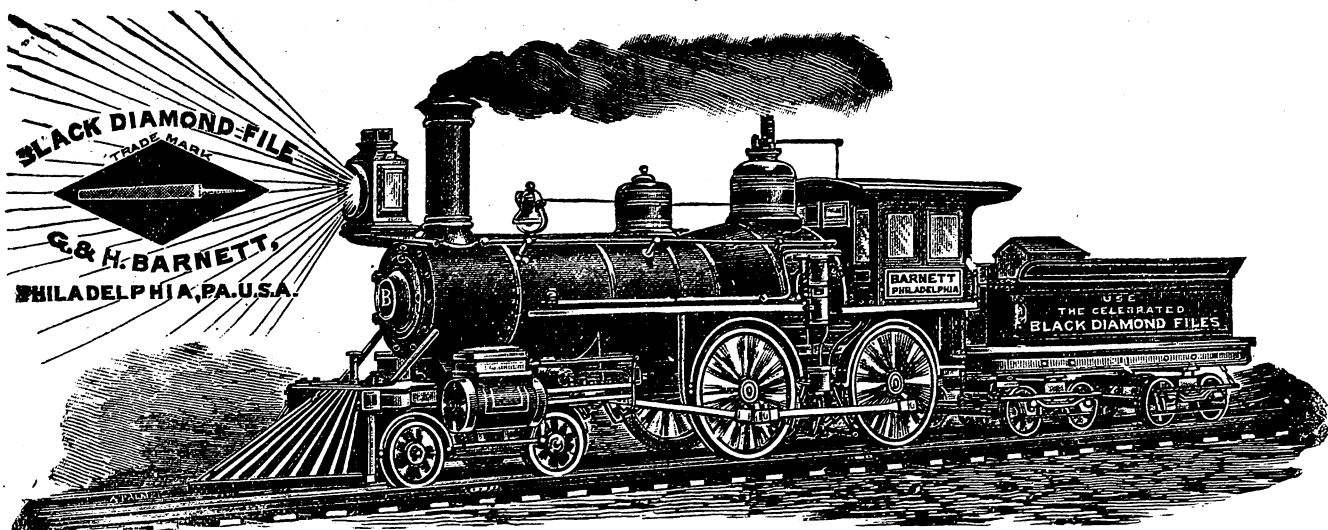
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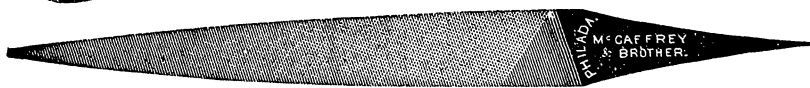
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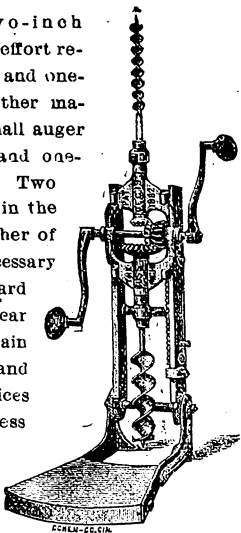
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Will operate a two-inch auger with the same effort required in using one and one-half inch in any other machine, and for the small auger have a speed two and one-half times faster. Two augers may be kept in the machine, to use either of which it is only necessary to point it downward by first taking the gear frame out of main frame, inverting and replacing it. For prices and discounts address

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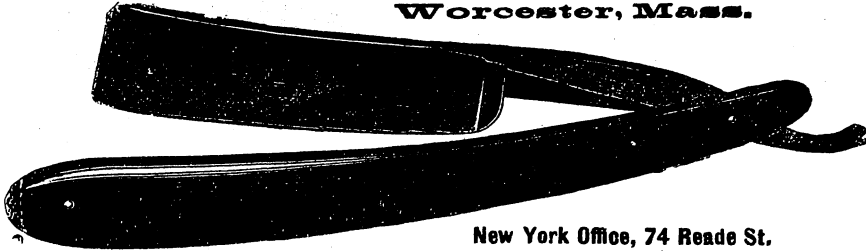
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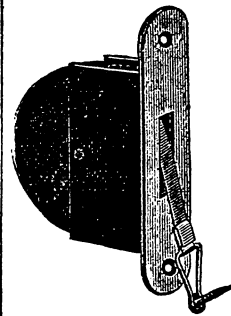
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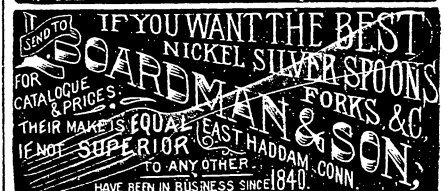
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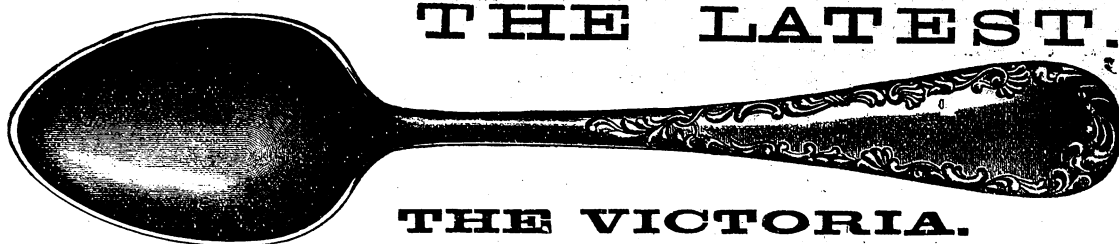


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Because "it's not built
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on a **Black Hawk
Nail Puller** every
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Price \$13.00 a dozen,
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We have a full line of above, which is the neatest pattern ever presented to the trade, and it is stamped



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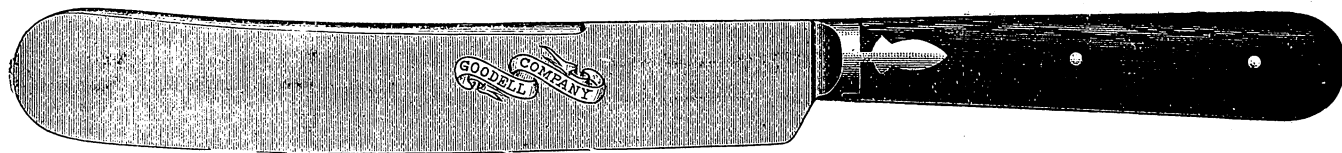


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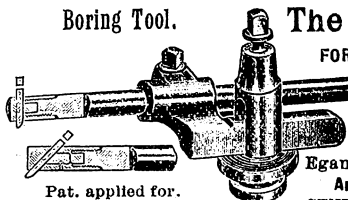
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Are Reliable.

Boring Tool.



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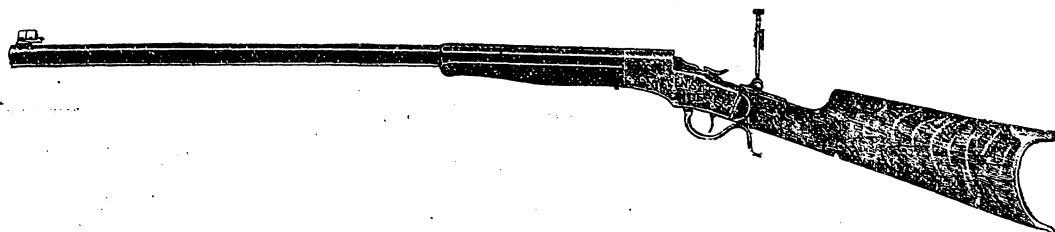
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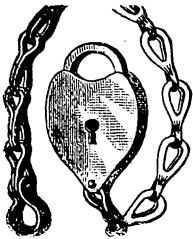
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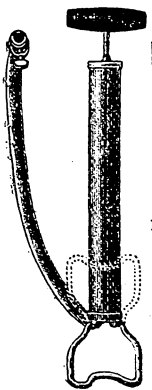


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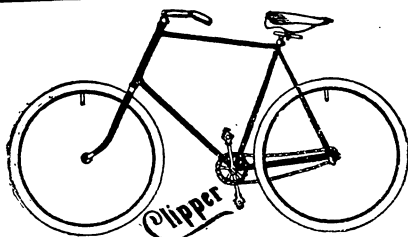
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Every Year

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Handle
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Some-
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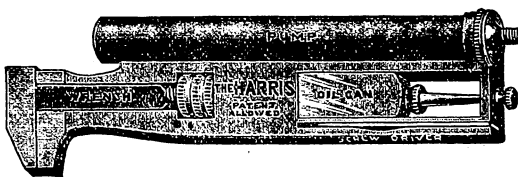
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Run as easily as Bicycles. Do not require any adjustment, and cannot get out of order. Sold by Toy and Hardware Jobbers. Manufactured by

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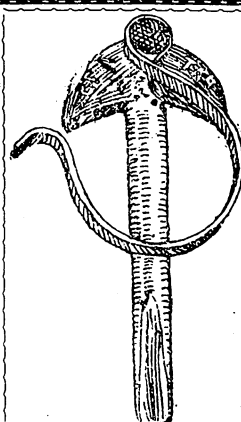
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Made of drop forged steel, case hardened; weight, 10 ounces or 3 ounces less than all the other tools separate.

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Sample sent
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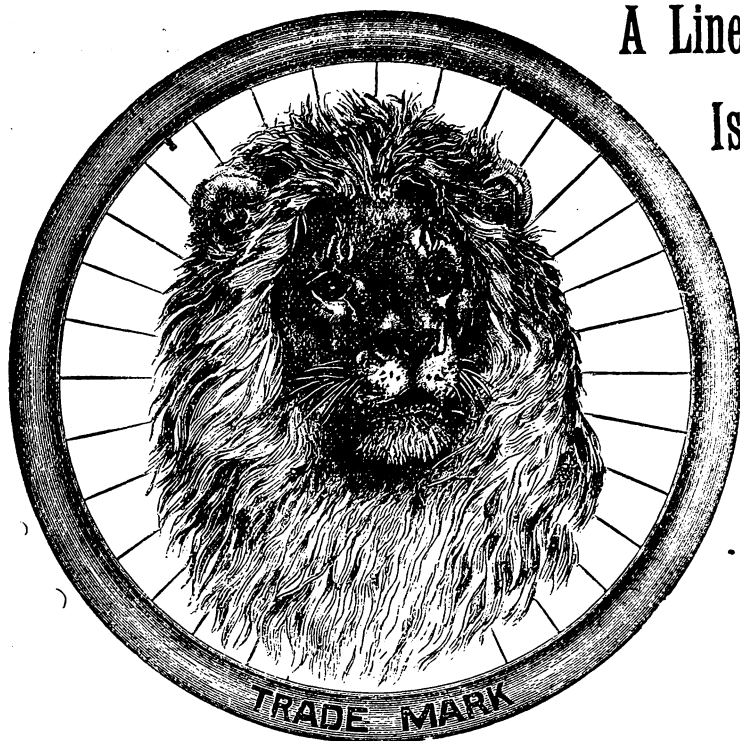
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Manufacturers of Sheets, Medals, Utensils



A Line of Hardware

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They will make you more money than anything you can handle.

At the World's Columbian Exposition they received a general award for all points, including

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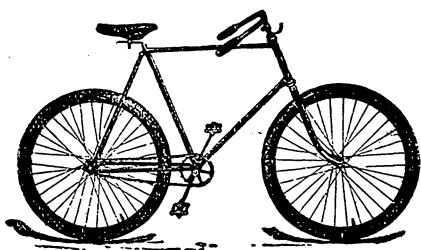
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Send for twenty-four page catalogue.

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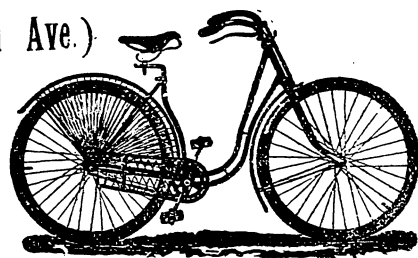
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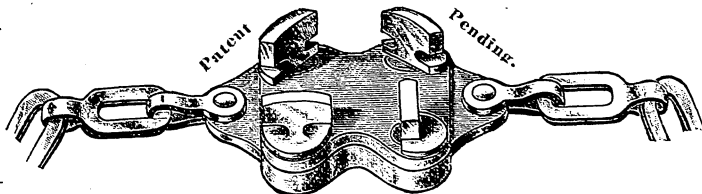
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THE GOODHUE COMBINATION LOCK

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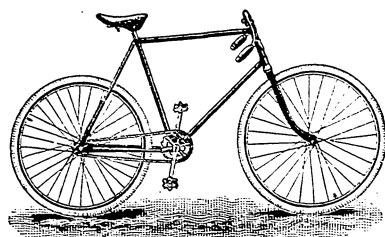
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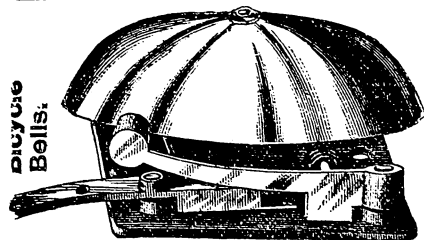
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In Design, Workmanship, Material and Finish they are **BEST.**
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For Sale by
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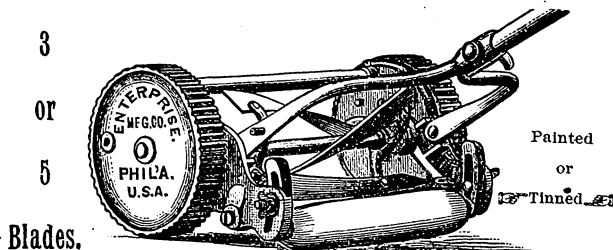
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Free.

ENTERPRISE LAWN MOWERS,

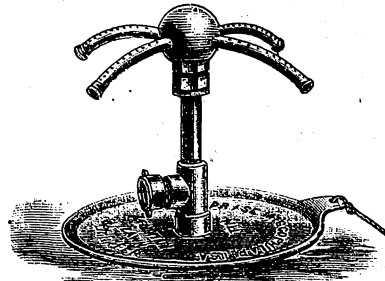
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Equal to the best in the market.
Prices quoted on application.

ENTERPRISE Lawn Sprinklers.

Finished
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Superior
Manner.



Muddy
Water
does not
Interfere
with it.

No well kept Lawn complete
without one.

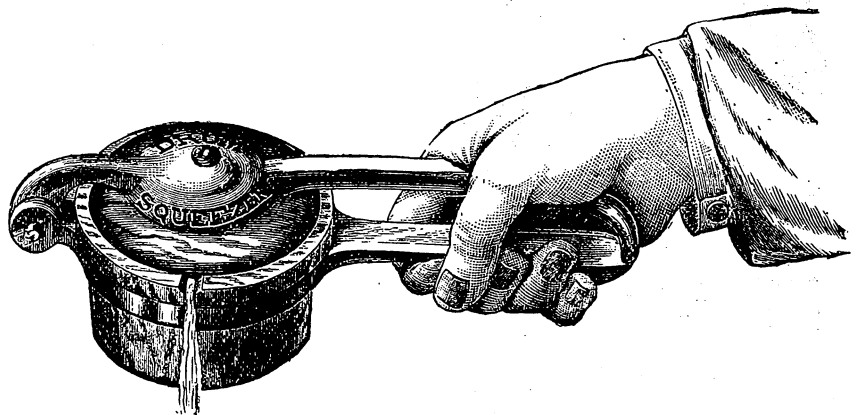
THE DRUM LEMON SQUEEZER.

ADVANTAGES.

No corrosion, as the metal does not come in contact with the juice.

No waste, for when the lemon is squeezed the juice is all retained, and there is no soiling of anything of the person using it.

The juice after being pressed out is all retained, and as much may be used as required and the balance kept perfectly clean and fresh until wanted. Any part can be readily duplicated. Packed one dozen in a case.



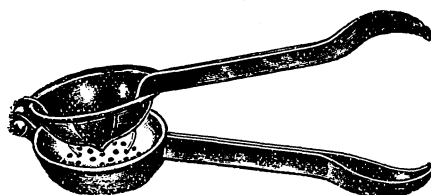
Porcelain Cup.

The Drum Squeezer sells at sight. Send for Prices.

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PHILLIPS SCREENS

Fire Reliable.



Do you make Lemonade?

If so you want our Squeezer. Positively the best. Suitable for any size Lemon. Write for catalogue and prices.

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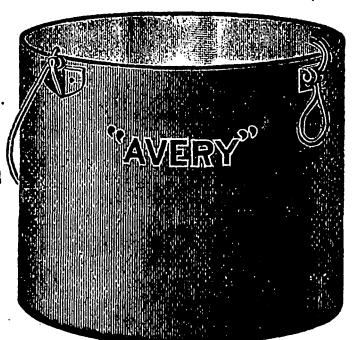
"SILVER STEEL"

HOLLOW WARE

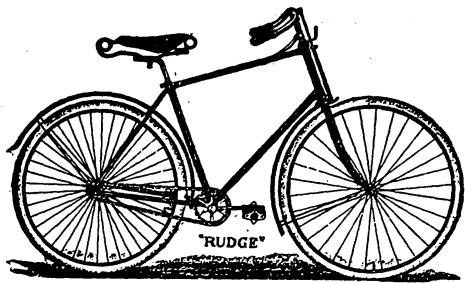
ALL KINDS OF

HEAVY and LIGHT STAMPING, BLANKING, &c., &c.

CLEAN and WHOLESOME.



THE AVERY STAMPING CO., CLEVELAND, O.



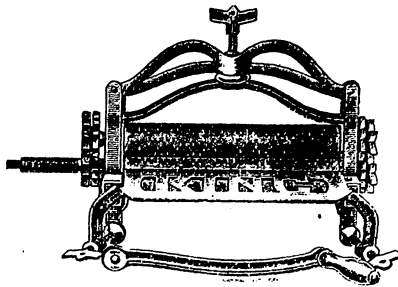
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Agents wanted immediately for unoccupied territory. Write for illustrated catalogue and Price-list of 1894 Wheels.

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We are Sole Manufacturers of the Celebrated Erie and King Wringers.

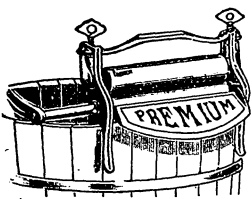
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Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

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New York Office, 107 Chambers St., John T. Ryan, Mgr.



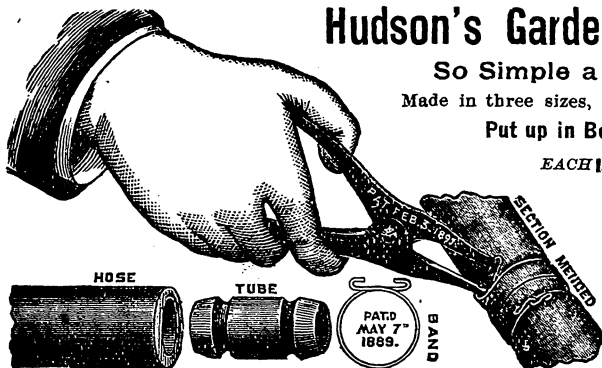
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MANUFACTURERS OF THE

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With Automatic Apron Adjustment.

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So Simple a Child Can Use It.

Made in three sizes, for $\frac{1}{2}$ in., $\frac{3}{4}$ in. and 1 in. hose.

Put up in Boxes for Family use.

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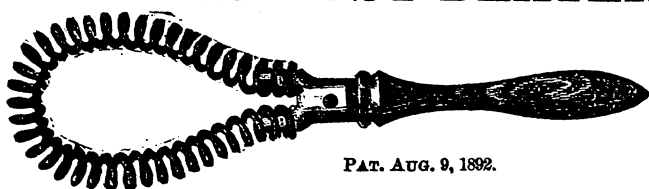
- 1 Pair Pliers,
- 20 Bands,
- 6 Tubes.

Sells readily at 75 cents.
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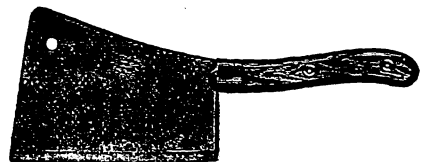
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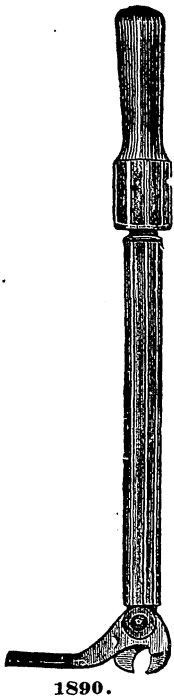
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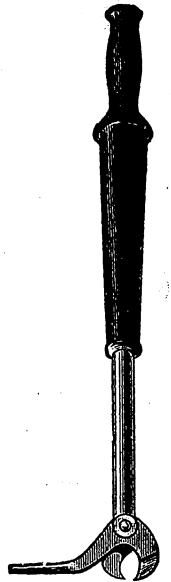
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Round Forged Blades, Mahogany Handles.



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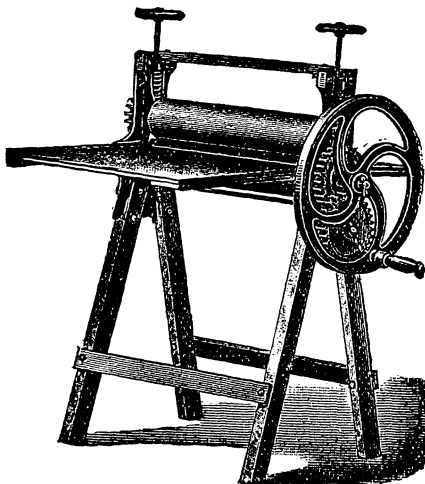
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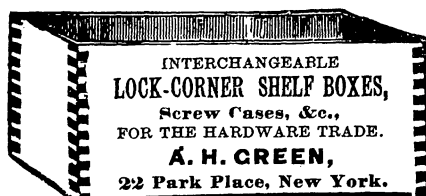
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SAVES all the fuel,
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Keeps the linen whiter.

We Guarantee Every Machine.

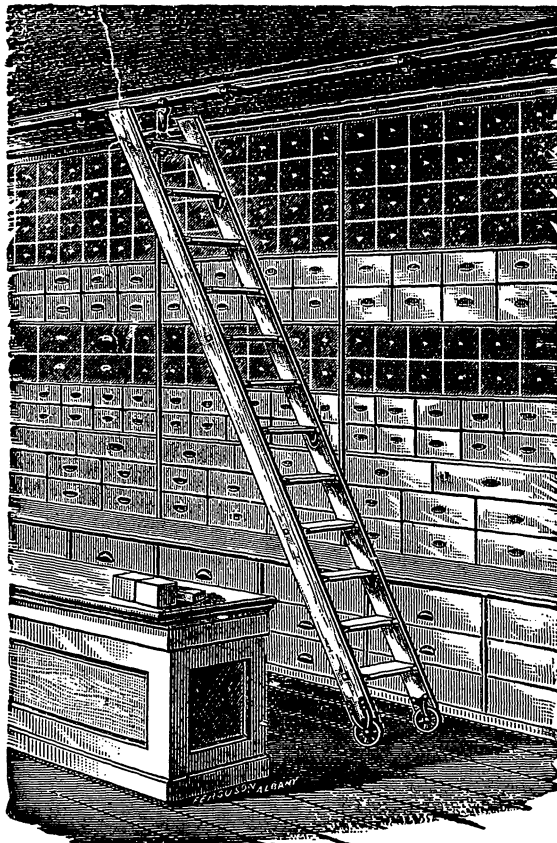


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LOCK-CORNER SHELF BOXES,
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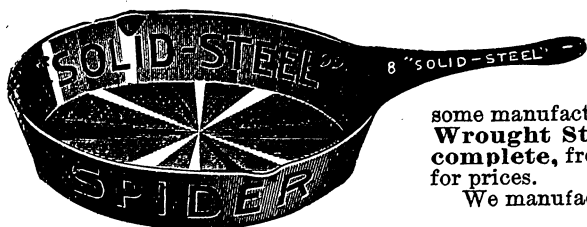


The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

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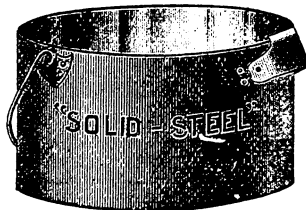
"SOLID-STEEL" SEAMLESS HOLLOW WARE.

No Seams, no Rivets in "Solid-Steel" Ware.

Brilliant Finish.

Notwithstanding the claims made by some manufacturers' agents our spiders are made from **Wrought Steel, Without Seams or Rivets.** complete, from a single piece of metal. Write for prices.

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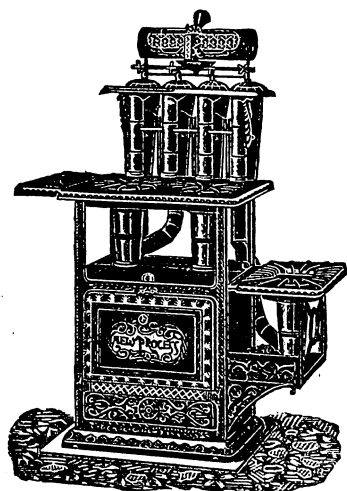
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The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.

Cooking Made Easy!

—BY THE—

"New Process" (Evaporating) Stove**LIGHTS LIKE GAS.**

Consumes less gasoline than any other vapor stove made. No waste when not cooking. No heat when not in use. No overheated kitchen.

More than a quarter million in use in the United States.

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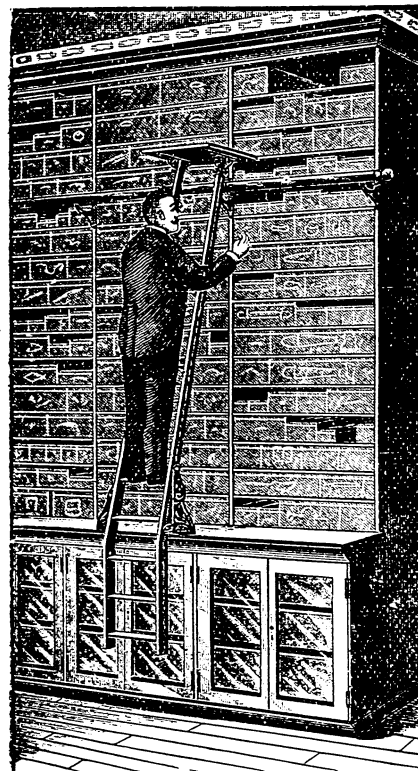
Bakes Better and Costs less than any Coal or Wood Range.

Saves both Time and Money. No Soot, no Dirt, no Ashes.

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Highest Award, Columbian Exposition. The Newest, Neatest, Simplest, Easiest Operated and Safest Store Ladder made.

Ladders are not Suspended, but Supported from below on wheels. Move easier with operator on than others when empty. Highly finished, and very handsome. Made in different grades and prices to suit. Send for illustrated catalogue and prices. See this space next week for other styles.

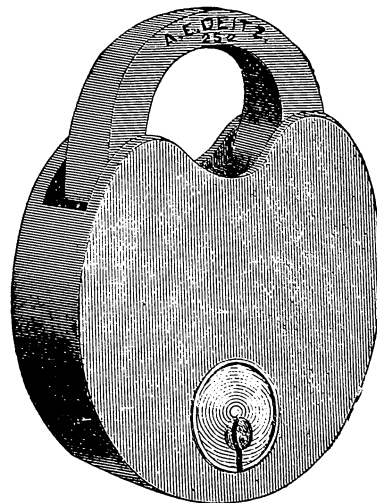
The Bicycle Step Ladder Co., 50 State Street, Chicago, Ills.

10 Years' Guarantee Goes With Every Ladder.

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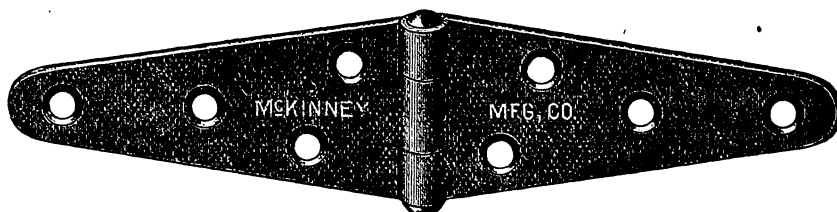
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STEEL HINGES AND BUTTS.

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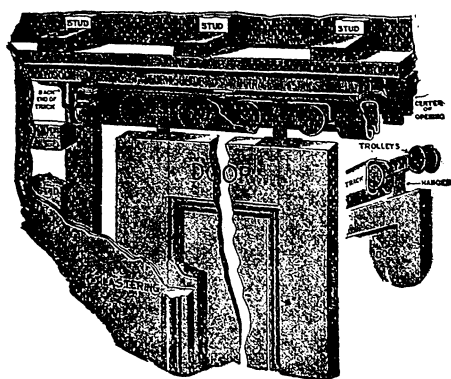
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ORDERS FILLED
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"NONE BETTER."



PARLOR DOOR HANGERS

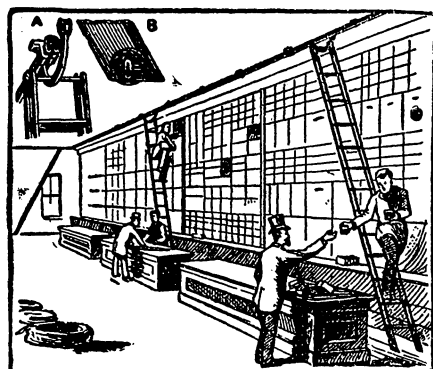
The adjustment is in the Track and not in the Hanger, as in other fixtures. Track can be taken out of Pocket and replaced without defacing walls after house is finished.

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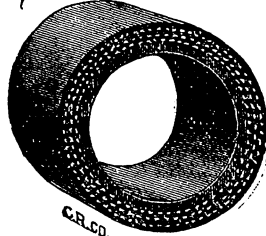
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Parlor, Barn and Fire Door Hangers
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SALES OF
Over Two Million Feet
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GARDEN HOSE

alone during the past year, distributed throughout the United States, and not a single piece complained of, justifies us in guaranteeing that it will give absolute satisfaction.

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Who has not lost time, patience, money, by attempting settlement for such goods ?

THE CAUSE in nine cases out of ten is the lapped seam.
THE REMEDY is in buying our

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Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers', Cotton Hose, &c.

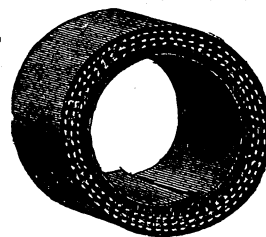
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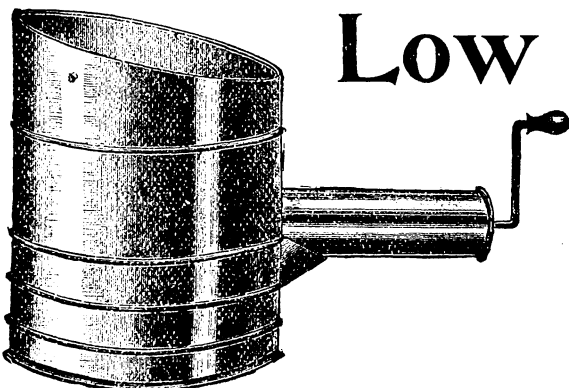
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Established Seventy-six years.

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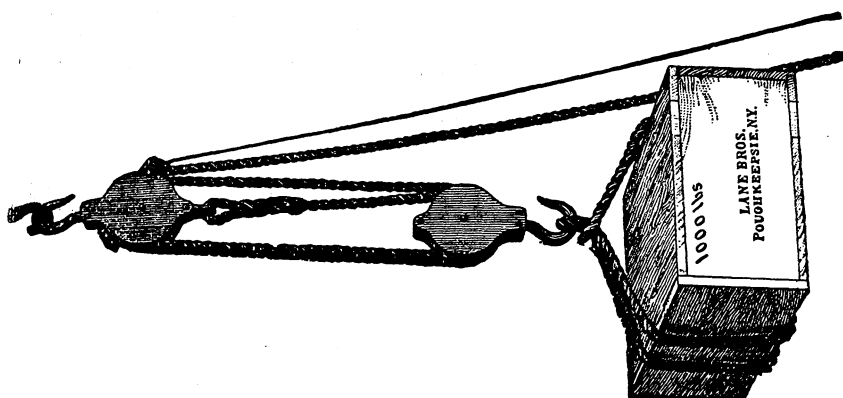
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Anti-Friction Steel Bushings,

Holds the load at any point, and always sure.

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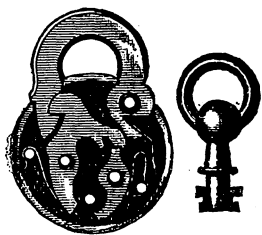
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PATENT PERFECTION PADLOCK.



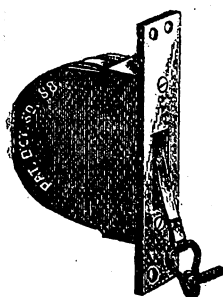
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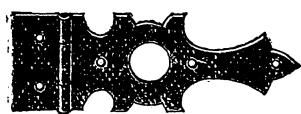
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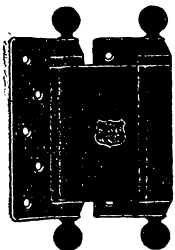


Bronzed Ornamental Wrought Steel Hinges,

Made from the best quality of Cold Rolled Steel and heavily plated. Unequaled for strength and finish.

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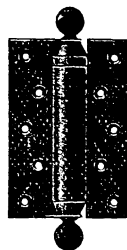
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Also of cast metal in all the finishes known to the trade.

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Best and Cheapest.

Does not obstruct flow of water. No tools or bands required.

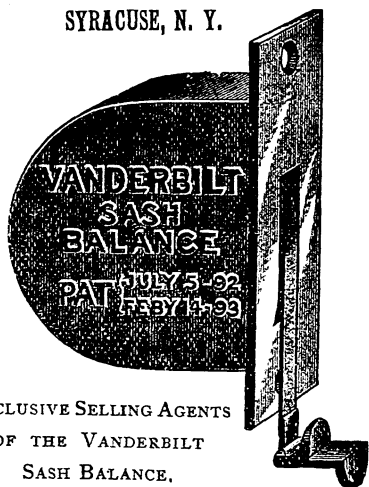
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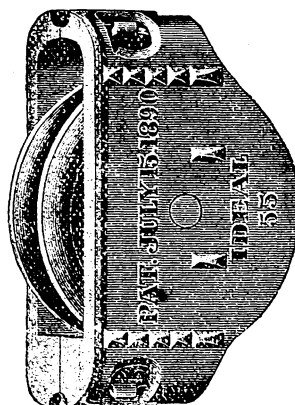


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Ideal Sash Pulley, No. 55.



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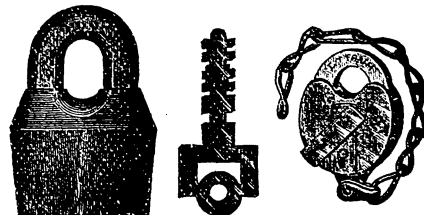
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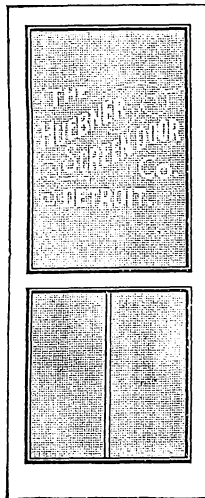
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Heavy and long
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THEY are made
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The Stiles are
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Wire Cloth. The
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is first-class in
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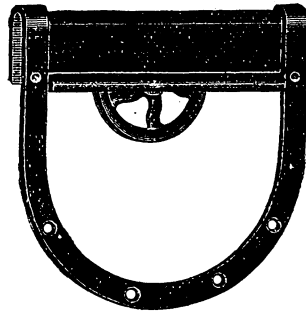
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READING HARDWARE COMPANY, READING, PA.

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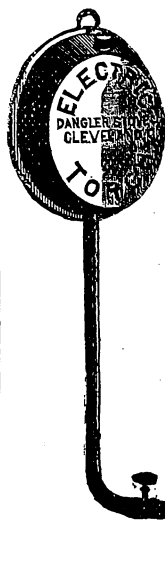
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Electric
Torches

FOR
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14 JETS OF LIGHT

3 to 6
INCHES
LONG.

FOR lighting manufacturing establish-
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brilliant, steady light, and by cheaper
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SOLE MANUFACTURERS,

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**THE SCHULTZE LOCK
UNPICKABLE.**

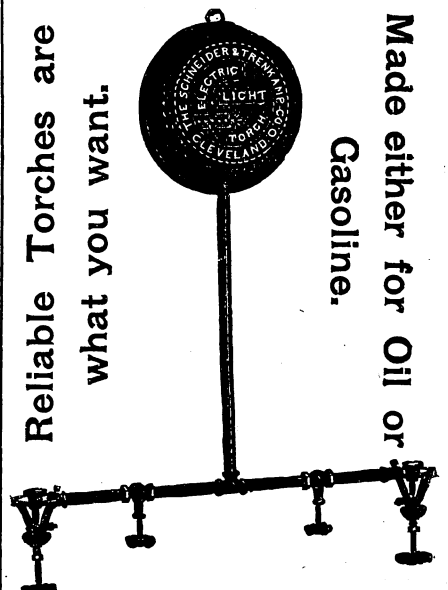


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MANUFACTURED ONLY BY

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Reliable Torches are
what you want.



Made either for Oil or
Gasoline.

These Torches are particularly adapted for use in
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about one-half cent to one cent per hour, burning a
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Write us for prices. A liberal discount given to the
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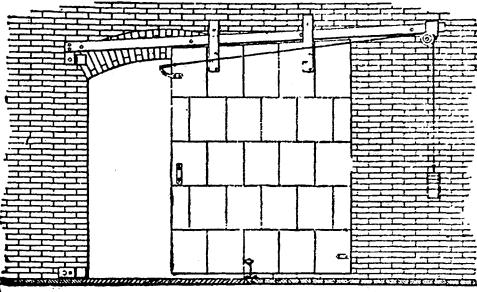
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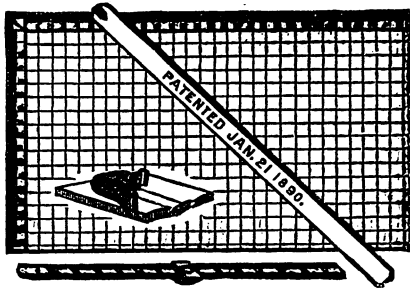
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These Fire Door Trimmings have the following advantages over all other devices for a similar purpose:
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Cuts any Fraction of an Inch by Eighths.

Unequaled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

ALSO —

IMPROVED TRAMMEL RULE for Cutting Circles

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WORKS AT MAYWOOD, ILL.

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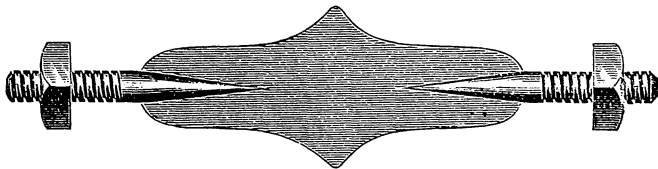
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SEND FOR CATALOGUE AND SUPPLEMENT.

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WHEN THE STEEL AND IRON

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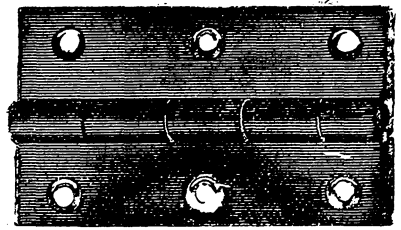
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ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.

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IN STOCK AND FOR SALE BY

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Nos. 16 & 18 Chambers Street, New York,

MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY HARDWARE.

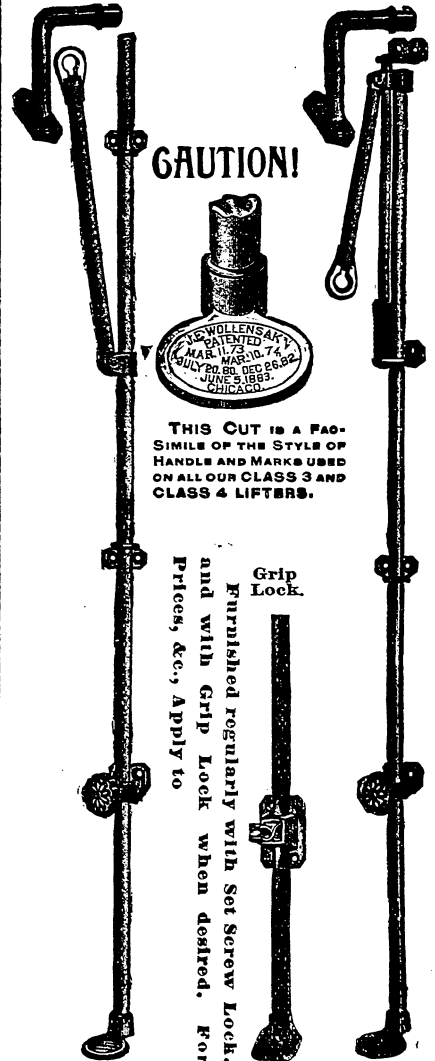
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OLD RELIABLE

J. F. WOLLENSAK'S PATENT.

CLASS 3.

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CAUTION!

THIS CUT IS A FAO-SIMILE OF THE STYLE OF HANDLE AND MARKS USED ON ALL OUR CLASS 3 AND CLASS 4 LIFTERS.

Grip Lock.
 Furnished regularly with Set Screw Lock, and with Grip Lock when desired. For Prices, &c., Apply to

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A Full Line of Carriage Hardware

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Estimates cheerfully given. Send for Catalogue

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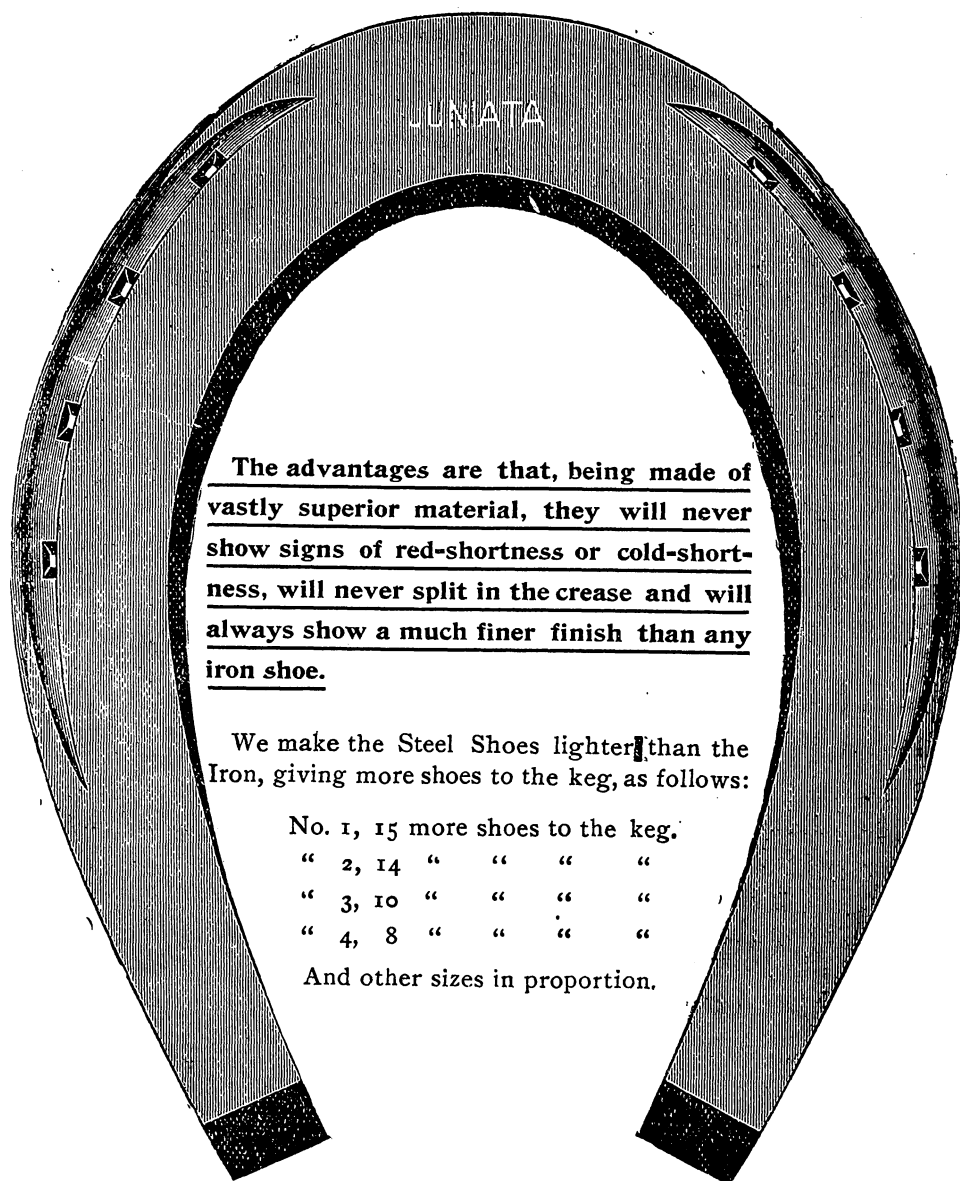
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After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

" 3, 10 " " " "

" 4, 8 " " " "

And other sizes in proportion.

No. 2 EXTRA SWAGED FRONT.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

SHOENBERGER & CO.,

JUNIATA IRON AND STEEL WORKS - - - PITTSBURGH, PA.

SCRANTON FORGING CO.,

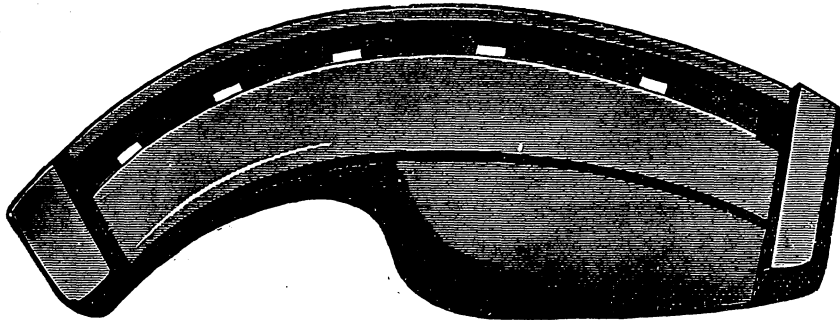
SCRANTON, PA

CARRIAGE HARDWARE AND SPECIAL DROP FORGINGS.

FORGED

OX

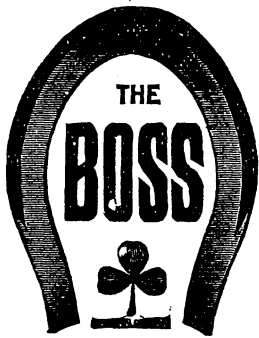
SHOES.



Made under Deebie's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



HORSE AND MULE SHOES.

Superior Quality, Shape and Finish.

BRYDEN HORSE SHOE CO.,

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RHODE ISLAND PERKINS HORSE SHOE CO.,
MANUFACTURERS OF

Horse and Mule Shoes of the Perkins Pattern.

SPECIALTIES:—X L Steel Shoes, Toe Weight Shoes and Goodenough Shoes.

Works at Valley Falls, R. I.

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F. W. CARPENTER, Pres.,

C. H. PERKINS, Gen. Manager,

R. W. COMSTOCK, Sec'y,

CHARLES B. STARK, Treas.

J. C. McCARTY & CO., Agents - 97 Chambers Street, New York.

THE NEW DIAMOND STATE HORSE AND MULE SHOES.

JUST TRY THEM and YOU will say they excel all others.

MANUFACTURED BY

DIAMOND STATE IRON CO.
WILMINGTON, DELAWARE.

Other "high grade" specialties in Rivets, Spikes, Splice Bars, Track and Machine Bolts, Blued Nuts, Stay Bolt Iron, Horse Shoe Iron, Bar Iron, &c.

PHILADELPHIA OFFICE,
206 So. Fourth St.

{ Correspondence invited }

NEW YORK OFFICE,
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Elegant Iron.

Beautiful Shape.

HORSE SHOES,

Light, Medium and Heavy.

MULE SHOES,

Light, Medium and Heavy.

Illustrated booklet and prices to all
parts of the world on application.

OLD DOMINION IRON AND NAIL WORKS CO.,

ARTHUR B. CLARKE, President.

Chicago Office, 45 La Salle St.

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HORSE SHOES.

"Burden Best"

Iron

Boiler Rivets.

The Burden Iron Co.

TROY, N. Y.

PHOENIX HORSE SHOES.

PHOENIX HORSE SHOE CO.,

ROLLING MILLS AND FACTORIES,

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Manufacturers of

HORSE AND MULE SHOES.

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"The Best Driving Nail."

HIGHEST AWARD
—AT—
World's Columbian Exposition.

In the tests submitted before the judges on awards the Capewell No. 6 was shown to be 17 per cent. tougher than No. 8 of other makes.

"The Best Nail to Hold."

CAPEWELL HORSE NAILS,
MADE BY
THE CAPEWELL HORSE NAIL CO., - - - HARTFORD, CONN.

Office of D. C. BURNHAM,
Director of Works, World's Columbian Exposition,
JACKSON PARK, CHICAGO, ILL.

October 28, 1893.

To THE CAPEWELL HORSE NAIL CO.:
Gentlemen—I have used your horse nails here on the horses belonging to the World's Columbian Exposition, and I think they are far superior to any others that I have ever used. As I have been in the horseshoeing business for about twenty-five years, I know what I am talking about.

Very respectfully,
HERMAN J. HENKE,
Foreman Blacksmith, World's Columbian Exposition.

The Capewell Patent Corrugated Horse Nail.

Needs No Clinching.

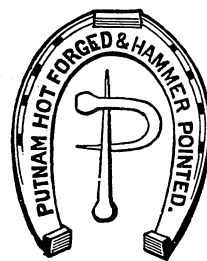
Highest Award

FOR

Supreme Excellence

TO

The **PUTNAM** Hot-Forged and
Hammer-Pointed Horse **NAILS,**



At the *World's Columbian Exposition* at Chicago. A medal and diploma worded:
"Supreme excellence in material, method in manufacture, and quality of finished product; elasticity and smoothness combined with holding power in clinch. It allows the use of very small nails."

There is nothing beyond "supreme excellence," nor is there anything comprised in a horse nail, except the "material from which it is made," "the method of manufacture," and "quality of finished product." Putnam nails, by their "elasticity," give slightly to the expansion and contraction of the hoof while the horse is in motion; by their "smoothness," do not enlarge the nail holes in the hoof, while their "supreme excellence," in "holding power in the clinch," enables them to hold the shoe in the hardest service until worn out.

By the "use of small nails," large holes are avoided and money saved to the smith.

Thus it will be seen that the officials of the *World's Columbian Exposition* recognize what qualities go to make up a good horse nail and that only the "Putnam" contains them all.

PUTNAM NAIL CO.,
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H. D. SMITH & CO.,

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MANUFACTURERS OF THE BEST QUALITY

CARRIAGE MAKERS' HARDWARE,

MANUFACTURE THE LARGEST VARIETY OF

FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

Send for Price and Illustrated List of

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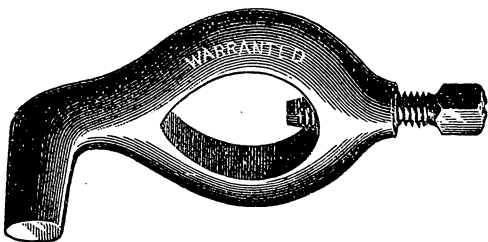
Manufactured by the NATIONAL HORSE NAIL CO.,
VERGENNES, VERMONT.

All Sizes. All Patterns. All Warranted. Sold Everywhere.

J. C. McCARTY & CO., Agents, New York.

LE COUNT'S HEAVY STEEL DOC,

With Steel Screws. U. S. Standard and the points hardened.



1.....	3/4.....	\$0 40	13.....	2 1/4.....	\$1 35
2.....	1.....	50	14.....	2 1/2.....	1 45
3.....	5/8.....	60	15.....	3.....	1 60
4.....	3/4.....	60	16.....	3 1/2.....	1 80
5.....	7/8.....	70	17.....	4.....	2 10
6.....	1.....	70	18.....	4 1/2.....	2 75
7.....	1 1/4.....	80	19.....	5.....	3 25
8.....	1 1/2.....	80	Full set of 19, \$23.60.		
9.....	1 3/4.....	95	20(extra) 5 1/2.....	4 00	
10.....	1 1/2.....	95	21.....	6.....	5 00
11.....	1 3/4.....	1 10	22.....	7.....	6 00
12.....	2.....	1 20	23.....	8.....	7 00
One small set of 8, by 1/4 in. to 2 in. 6 25					
One set of 12, by 1/4 in. to 2 in., continued by 1/4 in. to 4 in. 13 20					

When ordering, state as above, whether a full set, or a set of 12, or small set of 8, is wanted.

SEND FOR CATALOGUE OF FULL LINE OF MACHINISTS' TOOLS.

C. W. LE COUNT, MANUFACTURER, SO. NORWALK, CONN., U. S. A.
These goods are for sale by CHAS. CHURCHILL & CO., Ltd., 21 Cross St., London, England



Covert Pants Stretcher.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.
It removes all **WRINKLES** and **BAGGING** **AT THE KNEES**, giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for

brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of \$1.00.

MANUFACTURED ONLY BY

COVERT MFG. CO., West Troy, N. Y.

P. F. BURKE, C. F. DEWICK & CO.
Manufacturers of
PATENT STEEL
(Blunt and Sharp)
TOE-CALKS.
—ALSO—
BURKE'S IMPROVED
HORSESHOERS'
FOOT VICE.
Send for Circulars.
360 Dorchester Av. Die for Welding
BOSTON, MASS. Sharp Calks.

Crescent

Horse and Mule Shoes,
BAR IRON.

CRESCENT HORSE SHOE
IRON CO.

Max Meadows, Va.



FROST'S ANTI-RATTLER

Pat. Jan. 20, 1880.

Cut One-half Size.

Sample pair sent to any hardware or saddlery firm by addressing

The Frost Thill Spring Co.,

Boston, Mass.

P. J. Conroy & Co.,

Paschall, PHILADELPHIA.

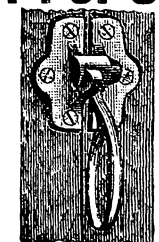
"CONROY"

Refrigerator Door

Fasteners

Have rapidly supplanted all others.

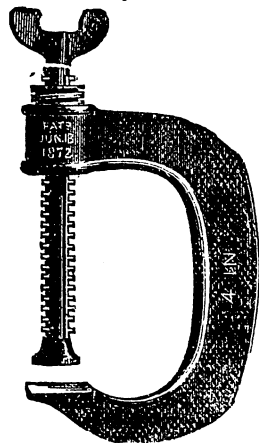
Refrigerator Trimmings.



Pat. Dec. 15, '85

BUFFALO SCALE CO., Buffalo, N. Y. SCALES OF ALL KINDS.

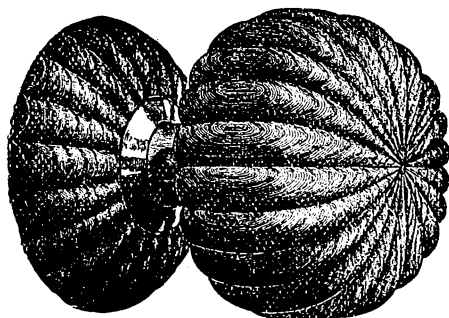
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OF
MALLEABLE IRON.
Hammer's Adjustable Clamps.



Hammer's Malleable Iron Oilers, 3 Sizes.
Malleable Iron Hand Lamps.
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NEW pattern Heavy Screw Clamps.
Strongest in the market.
For sale by all the principal Hardware dealers.
Send for Price List.

MALLEABLE IRON CASTINGS
of superior quality and Hardware Specialties
in Malleable Iron made to order.

HAMMER & CO.,
Branford, Conn.



**WOOD DOOR KNOBS,
DOOR SPRINGS AND CHECKS
AND CHECKING SPRING HINGES.**
NEW GOODS. NEW PRICES.
Send for New Price-List.
J. BARDSLEY, 149 & 151 Baxter St. New York.

**HARDWARE DEALERS
CAN RECOMMEND THE
CHAMPION METAL WINDOW
SASH CHAINS**

to their customers as a reliable substitute for
Sash Cords, very strong and lasting (some in
daily use ten years), and gives thorough satis-
faction wherever used. The patented attach-
ments are very simple and can be applied to
any window.

MANUFACTURED ONLY BY

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65 Elizabeth Street,

Write for Prices.

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The Practical Polish and Varnish Maker.
By H. C. STANDAGE. A treatise containing 750 re-
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nishes, polishes, &c. 12mo, cloth.....\$2.50
For Sale by DAVID WILLIAMS, 96-102 Reade St., N.Y.



This Wrench can be Furnished with long
Nut or Sleeve.

COMBINATION WRENCH.

Case-Hardened Throughout.

Parts Interchangeable

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the
requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.
For Circulars and Price-List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass., U. S. A.



TRIMO PIPE WRENCH,

Forged Steel.

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no
trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



**TRIMO
BASIN WRENCH.**

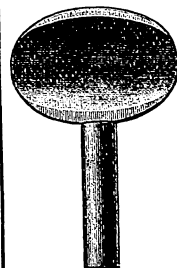
(Superior in strength and ease of operation.
COMPLETE circular grip. Never slips nor crushes.

Can be used with one
hand and in closer quarters
than any other Basin
Wrench. Parts Interchange-
able.

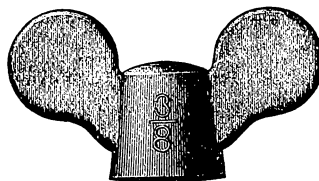
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THUMB-SCREW AND THUMB-NUT BLANKS. DROP-FORGED FROM BAR STEEL.

IRON, STEEL, BRONZE AND COPPER DROP-
FORGINGS OF ALL KINDS.

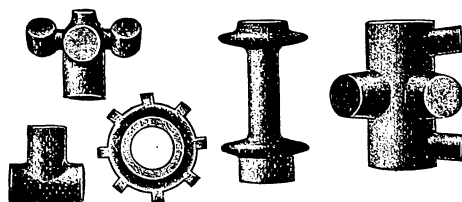


PLAIN.



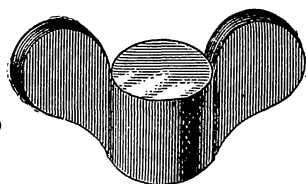
SHOULDER.

J. H. WILLIAMS & CO., - 9-15 Richards Street, Brooklyn, N. Y.
BROCK'S PATENT CHAIN PIPE WRENCH.

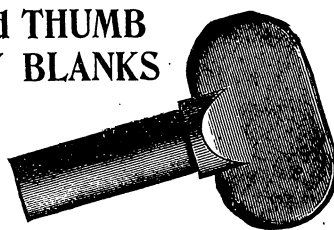


**WYMAN & GORDON
WORCESTER, MASS.
DROP FORGINGS**

FORGED THUMB NUT and THUMB SCREW BLANKS



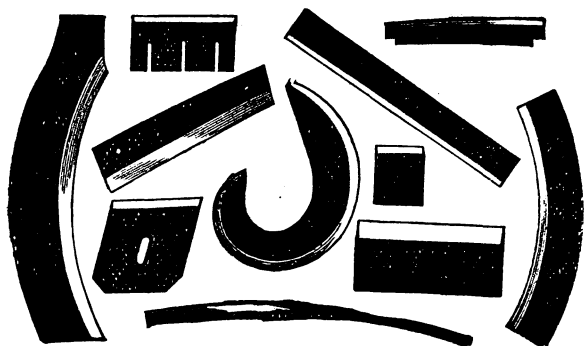
Drop
Forgings
of Every
Description



For Bolts from $\frac{3}{8}$ inch to $\frac{1}{2}$ inch.

The Billings & Spencer Co. Hartford, Conn.

Shoulder Thumb Screws.
Forged Thumb Screws.
Forged Steel Thumb Screws with
Black Heads.
Elevating Thumb Screws.



LORING COES & CO.

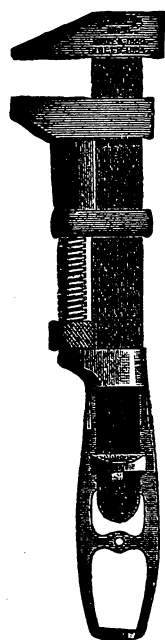
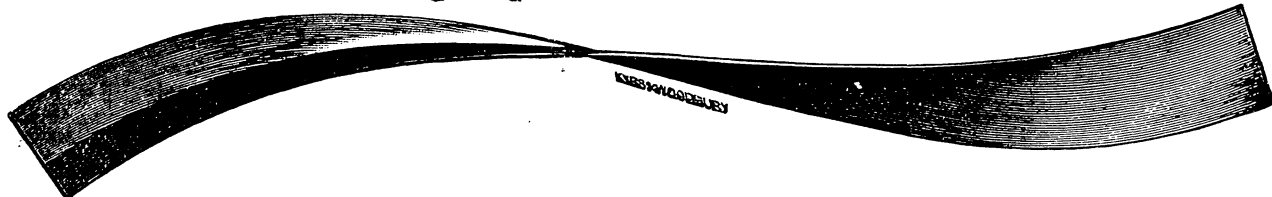
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Manufacturers of **MACHINE KNIVES.**

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.

End view of Plated Stock for Dies, Lawn Mower Knives, Blades

Etc., showing how the Steel is laid.



L. COES'

Genuine Improved
KNIFE HANDLE
PATENT

Screw Wrenches

MANUFACTURED BY
COES WRENCH CO.,
WORCESTER, MASS.

Established in
1839.
Registered
March 31, 1874.

Patented July
6, 1880.
Patented July
8, 1884.

Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

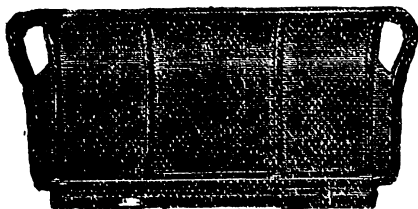
1" Straight Bar, Extra Long Nut for Screw in Jaw.

The **BEST MADE** and **STRONGEST WRENCH** in the MARKET.

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McKINNON DASH & HDW. CO.,

LIMITED, Manufacturers of



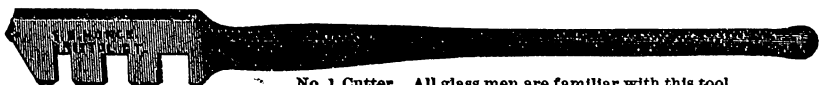
G. PATTERN.

SURREY DASH.

**FINE QUALITY
DASHES
AND
FENDERS,**

BUFFALO. - N. Y.

MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS



No. 1 Cutter. All glass men are familiar with this tool.

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FOR ANTHRACITE AND BITUMINOUS MINING

6 DIFFERENT STYLES OF SPOUTS.
SAMPLE 15¢.

SEAMLESS BRASS COLLAR
BRASS HINGE
Lid solid
No SOLDERING

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Pat. Lawn Sprinkler.
Cheapest and Best in Use.

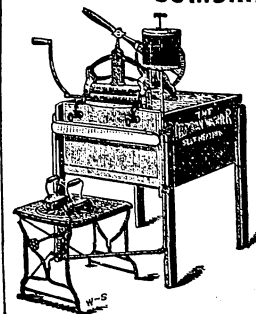
The Spray from it covers upwards of 1,000 sq. feet of lawn. It is the only patent adjustable Sprinkler which is adaptable to any water pressure. Being made of brass, and having no revolving parts to wear out, or small openings to clog up, it can be operated with sandy or muddy water as well as clear, and will last for years. To operate, screw Sprinkler on end of hose, stick thered in to the ground in a vertical position, adjust the acorn to suit pressure and spray wanted and it is ready for use. It may be so regulated as to throw a spray as coarse as rain or as fine as mist, and will make one of the most beautiful fountains imaginable. It is unequalled in merit, requires no attention and is sold at a less price than any sprinkler in the market. Remember, the RIVAL is the only Sprinkler made by which the coarseness of the spray and the area to be wet can be regulated. They are packed 1 doz. in a box, and finished either plain or nickel plated.

The **JOHN H. MCGOWAN CO.**
Cincinnati, Ohio.

Agents Wanted. Liberal discount to buyers.

1/4 inch Regular Hydrant Thread, 1 inch (or 1 1/2 inch) Pipe Thread to order) per doz \$7.50 12.00
1 inch Sample Sprinkler each, prepaid on receipt of 60 cents.

COLUMBIAN WASHER and STOVE COMBINED.



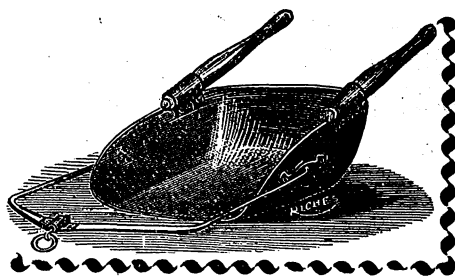
The most complete washer on the market.

**Benbow
M'g Co.,**
St. Louis.

Honor without Profit

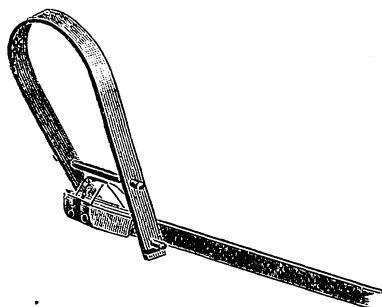
may be all right under certain conditions, but it won't pay bills. When you sell honorable goods at profitable prices in these times, that's different. You can do this with our productions always.

The Kilbourne & Jacobs Mfg. Co., COLUMBUS, O.



Improved American. IRON RESERVOIR VASES.

PATENT PENDING.



THE BISHOP POKES are the best, as they are made from good material, are very strong, and have all the latest improvements up to date. Shun other pokes said to be just as good, for they are not. For names of Bishop Pokes we refer to price-list in *Iron Age*. They are for sale by nearly every jobber of hardware in the U. S.

A. W. BISHOP,
MAKER,
BEREA, - - - OHIO.



Nearly 100 styles and sizes.

List prices from \$6.00 to \$100.00 each.

These Vases are made with a reservoir for water, from which a constant and even supply of moisture is drawn by capillary attraction, and they do not need watering often—less than once in ten or fifteen days. Thousands of Reservoir Vases are in

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Catalogue sent on application.

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Law without Lawyers.

A Compendium of Business and Domestic Law for Popular Use.

By H. B. COREY,
Member of the New York Bar,

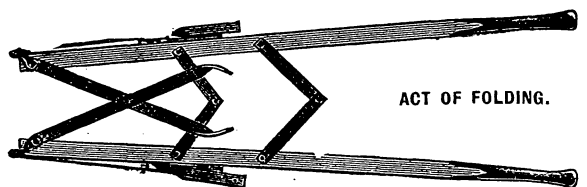
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A simple, clear and accurate presentation of the general laws, and of the laws of the several States relating to the rights of property, contracts, debts, partnerships, bankruptcy, insurance, corporations, marriage, divorce, &c., &c., with which are included correct copies of all legal instruments and forms, such as notes, deeds, mortgages, leases, wills, &c., and a dictionary of legal words and phrases.

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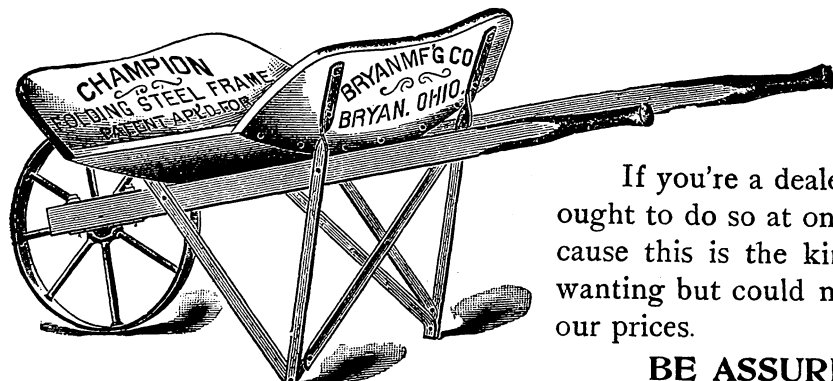
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ACT OF FOLDING.



FOLDED.



The Champion

Folding Steel Frame Barrow

Beats 'Em All.

If you're a dealer and haven't ordered a sample you ought to do so at once. It's money in your pocket, because this is the kind of barrow your customer's been wanting but could never get. Write us anyway and get our prices.

BE ASSURED IT WILL PAY YOU.

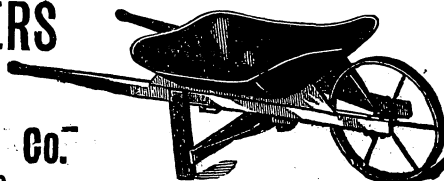
ALL STEEL

WHEELBARROWS & SCRAPERS

MANUFACTURED BY

AMERICAN STEEL SCRAPER CO.

104 Court Street, SIDNEY, O.



Write for Catalogue

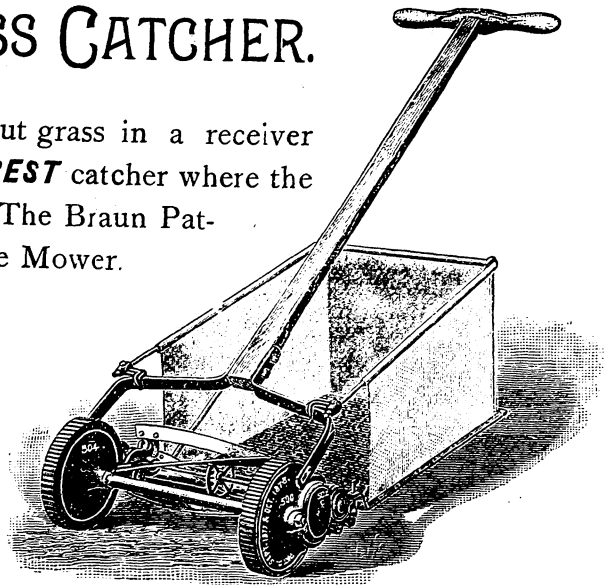
THE BRAUN PATENT GRASS CATCHER.

It seems to be the proper thing to collect the cut grass in a receiver or catcher, and of course you will look for the **BEST** catcher where the **BEST** Lawn Mowers are made. Well, here it is—"The Braun Patent," made in all sizes and **GUARANTEED TO FIT** the Mower.

Write for Price-Lists and Discount.

Supplee Hardware Co.,

. . . . PHILADELPHIA.



McGuire's ♦ Diamond.

MANUFACTURED BY

Dille & McGuire Mfg. Co.,
RICHMOND, IND., U. S. A.

PRICE-LIST.

Wheels, 8 Inches High. Cutter, 5½ Inches Diameter.

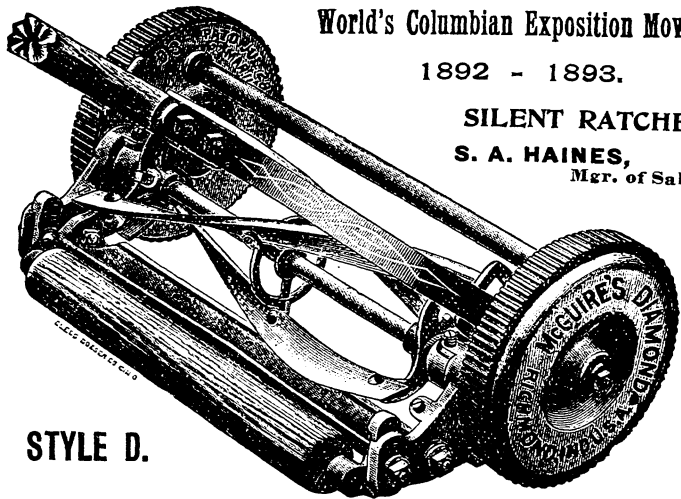
LENGTH.	LIST.	Discount to the
10 Inch	\$13.00	Trade,
12 "	14.00	70 per cent.,
14 "	15.00	F.O.B. Factory.
16 "	16.00	
18 "	17.00	

PHOSPHOR BRONZE JOURNAL BEARINGS. BEST QUALITY STEEL.

This is the Mower contracted for by the Chief of Construction at the Columbian Exposition; was used on the lawns at the World's Fair grounds during the preparatory season of 1892, and being approved by the Landscape Architects, was adopted exclusively for 1893.

If you wish a first-class Mower in all respects, one that is fully warranted,

— **BUY MCGUIRE'S DIAMOND.** —



STYLE D.

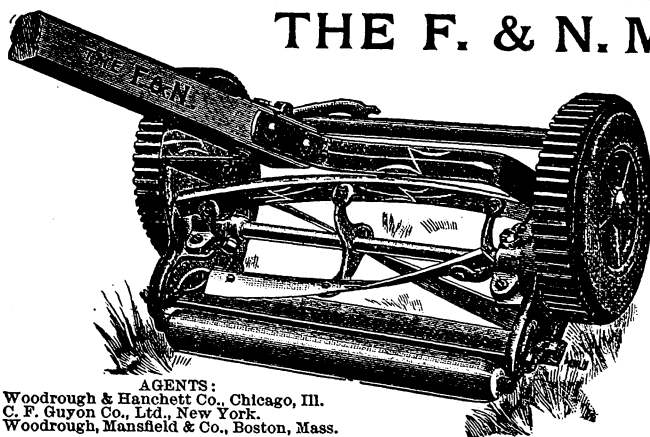
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World's Columbian Exposition Mower.

1892 - 1893.

SILENT RATCHET.

S. A. HAINES,
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Manufacturers of
Lawn Mowers
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F. & N.
LAWN
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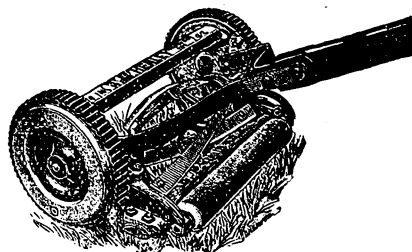
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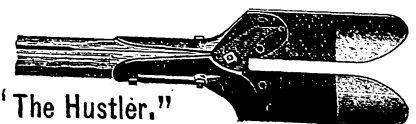
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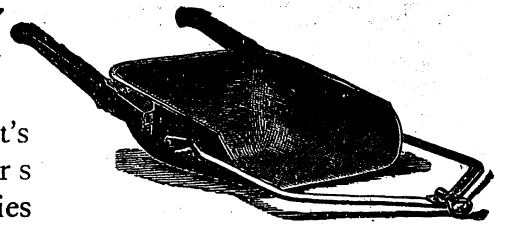
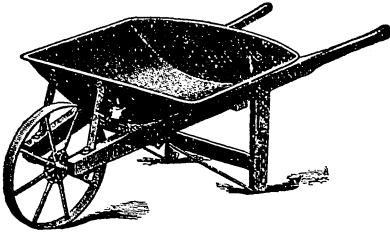
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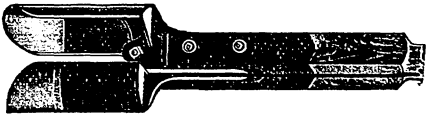
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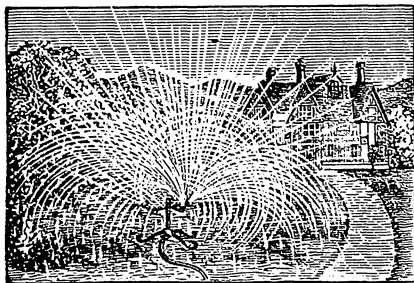
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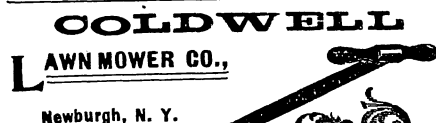
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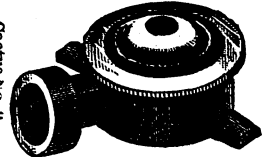
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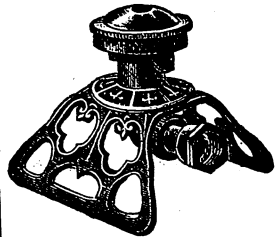
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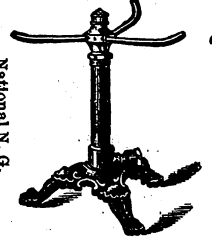


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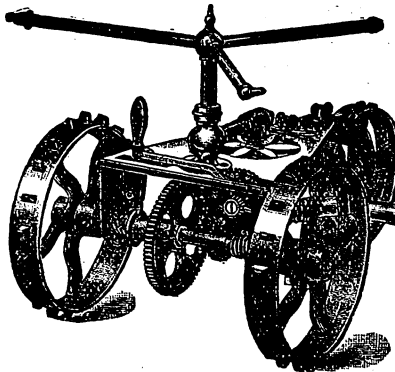


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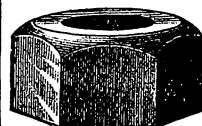
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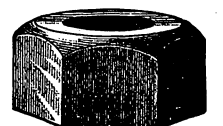
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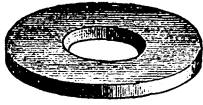
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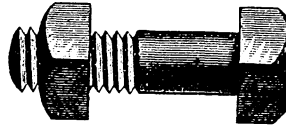
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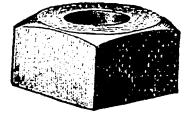
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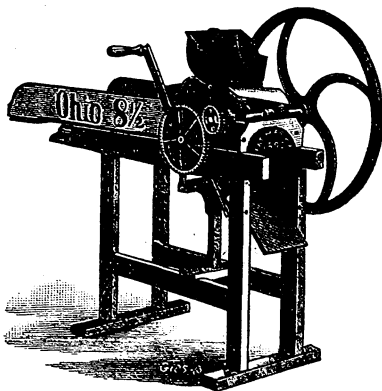
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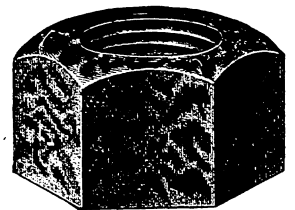
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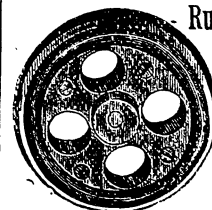
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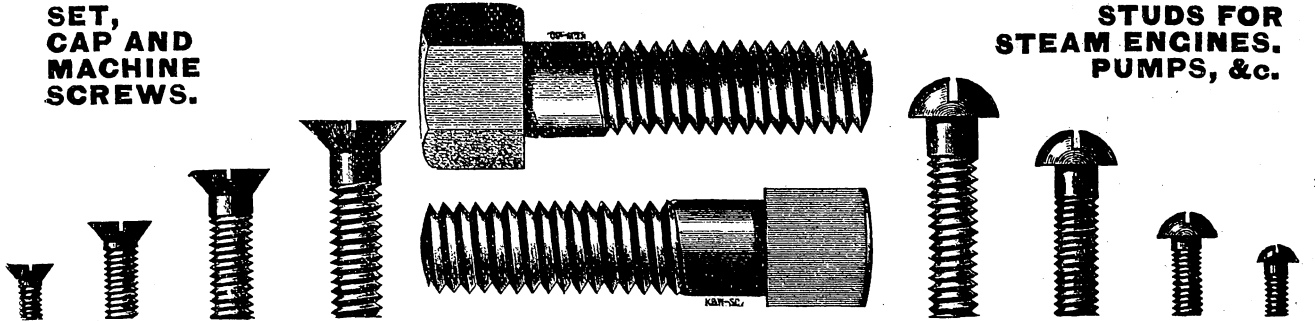
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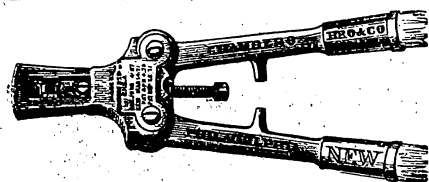
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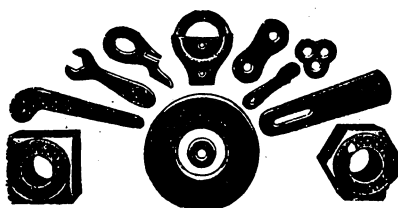
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Le Count, C. W., So. Norwalk, Conn.

Coal.
Barns, C. K. & Co., Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.

Coke.
Barns, C. K. & Co., Philadelphia, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Rainey, W. J., Cleveland, O.
Wister, Francis, Philadelphia, Pa.

Collections.
Hardware Board of Trade (Limited), 4 and 6 Warren, N. Y.

Condensers.
Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.
Brown, Hoisting & Conveying Machine Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Copper.
Ames Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 294 Pearl, N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Wister, Francis, Philadelphia, Pa.

Cordage.
Samson Cordage Works, Boston, Mass.

Cork Screws.
Williamson, C. T. Wire Novelty Co., Newark, N. J.

Corrugated Furnaces.
Continental Iron Wks., Brooklyn, N. Y.

Corrugated Iron.
Cincinnati Corrugating Co., Piqua, O.
Cambridge Roofing Co., Cambridge.
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Counting Machines.
Durant, W. N., Milwaukee, Wis.

Cranes.
Detroit Foundry Equipment Co., Detroit, Mich.
Halsey, W. S. & Co., Birdshoro, Pa.
Maris & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Yale & Towne Mfg. Co., Stamford, Conn.

Cupolas, Hot Blast.
Byram & Co., Detroit, Mich.
Detroit Foundry Equipment Co., Detroit, Mich.

Curry Combs.
Gibbs Mfg. Co., Canton, O.

Cutlery Cases.
Torrey, J. R. & Co., Worcester, Mass.

Cutlery Enamel.
Shipley, A. B. & Son, Phila., Pa.

Cutlery, Importers of.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.
Bingham, W. Co., Cleveland, Ohio.
Dane, Stoddard & Kendall, Boston, Mass.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northampton, Mass.
Wilson, John, Sheffield, England.

Cyclometers.
Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

Dashes and Fenders.
McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y.

Dies.
Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Door Checks and Springs.
Bardsley, J., 149 & 151 Baxter St., N. Y.

Drain Cleaners.
Buckeye Mfg. Co., Union City, Ind.

Drilling Machines.
Bickford Drill & Tool Co., Cin., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Colburn, A. M., New Haven, Conn.
Dallett, Thos. H. & Co., Philadelphia.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Dwight Lathe Machine Co., Hartford, Conn.
Goddard, Asa, Worcester, Mass.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Norton & Jones Machine Tool Works, Plainville, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Drop Forgings.
Billings & Spencer Co., Hartford, Conn.
Boone, W. C. Mfg. Co., Bonton, N. J.
Eccles, Richard, Auburn, N. Y.
Merrill Bros., Brooklyn, E. D.
Miner & Peck Mfg. Co., New Haven, Ct.
Phila. Drop Forge Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
Williams, J. H. & Co., Brooklyn, N. Y.
Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.
Wyman & Gordon, Worcester, Mass.

Drop Presses.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven, Conn.
Stiles & Parker Press Co., Brooklyn, N. Y.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Dumb Waiters.
Hutchinson, F. S. Co., 32 Warren Street, N. Y.
Storm Mfg. Co., Newark, N. J.

Dust Beaters.
Peabody & Parks, Troy, N. Y.

Dynamite.
New York Powder Co., 62 Liberty St., N. Y.

Dynamos.
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.

Edge Tools, Makers of.
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
Plumb, Layette R., Philadelphia, Pa.
White, L. & I. J. Co., Buffalo, N. Y.

Edging Shears.
Dille & McGuire Mfg. Co., Richmond, Ind.

Egg Beaters.

North Bros. Mfg. Co., Philadelphia, Pa.

Electric Bells and Supplies.

Ostrander, W. R. & Co., 204 Fulton St., New York.
Wollensak, J. F., Chicago, Ill.

Electric Dynamo Machines.

Eddy Electric Mfg. Co., Windsor, Conn.

Elevators, Makers of.

Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Penna. Elevator Engineering Co., Phila., Pa.

Emery and Emery Wheels.

N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., N. Y.
Sturtevant Mill Co., Boston, Mass.

Emery Wheel Dressers.

Bay State Stamping Co., Worcester, Mass.

Engineers and Contractors.

Aiken, Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amster & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.

Engines, Gas.

Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer Bldg., N. Y.

Engines, Gas and Gasoline.

Springfield Gas Engine Co., Springfield, Ohio.

Engines, Steam, Makers of.

Bass Foundry & Machine Works, Ft. Wayne, Ind.
Erle Engine Works, Erie, Pa.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Southwest Foundry & Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.

Sweetser, W. A., Brockton, Mass.

Expansion Bolts.

Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.

Faucets, Self-Measuring.

Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden, Makers of.

John Sommer's Son, Newark, N. J.

Feed-Water Heaters and Purifiers.

Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Works, Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.

Fencing, Iron and Wire.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clampson Fence Co., Indianapolis, Ind.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 49 Cliff St.
Illmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.

Files, Importers of.

Moss, F. W., 80 John St., N. Y.

Files and Rasps, Manufacturers of.

Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond, Phila.
McCattrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.

Fire Brick, Makers of.

Borner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer, B. & Sons, foot E. Houston St., N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge.

Fire Doors.

Berlin Iron Bridge Co., E. Berlin, Conn.
Victor Mfg. Co., Newburyport, Mass.

Fishing Tackle.

Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Flour Sifters.

Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.

Flue Cleaners.

Mackey, Jas. T., St. Louis, Mo.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Forges, Portable, &c.

Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Foss Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.

Forks, Hay and Manure.

Iowa Farming Tool Co., Ft. Madison, Iowa.

Foundry Facings.

Dixon, Jos., Crucible Co., Jersey City, N. J.
S. Obermayer Co., Cincinnati, O.
Smith, J. D., Fdy. Supply Co., Cin., O.

Foundry Riddles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

Diamond Clamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Smith, J. D., Fdy. Supply Co., Cin., O.

Friction Clutches.

Brown, A. & F., 17 Dey St., N. Y.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Friction Cone.

Evans Friction Cone Co., Boston, Mass.

Furnaces, Foundry.

Byram & Co., Detroit, Mich.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas & Steam Fitters' Supplies.

Pancoast, Henry B. & Co., Phila., Pa.

Gauge, Rolling Mill.

Haines Gauge Co., Philadelphia, Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London, Conn.

Gears.

Boston Gear Works, Boston, Mass.
Poole, Robt. & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.

Glass Boards.

Canton Saw Co., Canton, O.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glue.

Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Russia Cement Co., Gloucester, Mass.

Grass Catchers.

Supplee Hardware Co., Phila., Pa.

Grinding Mills.

Foss Mfg. Co., Springfield, O.

Grinding and Polishing Machines.

Norton Emery Wheel Co., Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stove Co., Cleveland, O.

Gunpowder, Makers of.

Lafin & Rand Powder Co., 29 Murray St., N. Y.

Handles.

New York Mallet and Handle Wks., 456 E. Houston St., N. Y.

Hangers, Door.

Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.

Hardware Comm'n Merchants.

Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Manufacturers.

Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs.' Agents.

Bingham, W. Co., Cleveland, O.
Clarke, Thomas, St. John, N. B.
Graham, John H. & Co., 113 Chambers.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
Burger Bros., Philadelphia, Pa.
Bourke Mfg. Co., Youngstown, O.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Haines & Zimmerman, Phila., Pa.
Johnson, S. C., Racine, Wis.

North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Scranton & Co., New Haven, Conn.
Wilson, J. Fred., Worcester, Mass.
Wrightsville Bdw. Co., Wrightsville, Pa.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
Coverter's Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.

Hog Rings and Ringers.

Oakes & Irwin, Decatur, Ill.

Hoisting Machines.

Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Fulton Iron & Engine Wks., Detroit, Mich.

Harrington, E. Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
McCoy, Jos. F. & Co., 26 Warren St.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Speidel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Avery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.

Hollow Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Horse Nails, Makers of.

Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.

Horse and Mule Shoes, Makers of.

Byrden Horse Shoe Co., Catsaqua, N. Y.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.

Hose Menders.

Hudson, C. E. & Co., Leominster, Mass.
Jones, M. D. & Co., Boston, Mass.

Hose.

Cleveland Rubber Works, Cleveland, O.
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.
McCoy, Jos. F. Co., 26 Warren St., N. Y.

Ice Breakers.

Clement & Dunbar, Philadelphia, Pa.
Wharton, Jos. S., Lovering, Phila., Pa.

Ice Cream Freezers.

Clement & Dunbar, Phila., Pa.
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.

Injectors.

Bynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York.

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Ethridge, Barclay W. & Co., Phila.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. & Co., Phila., Pa.

Iron Ore.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barns, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussenutz & Cunliffe, Philadelphia.
Corning, Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Ethridge, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J. J., 446 West St., N. Y.
Nicholls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.

Iron, Sheet, Manufacturers of.
Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Lim., McKeesport, Pa.

Iron Vases.

Walbridge & Co., Buffalo, N. Y.

Ironwork, Ornamental.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.

Keys.

Wollensak, J. F., Chicago, Ill.

Ladles.

Detroit Fdy. Equipment Co., Detroit, Mich.

Lamps.

Standard Lighting Co., Cleveland, O.

Lanterns.

Steam Gauge & Lantern Co., Syracuse, N. Y.

Lathes.

Dietz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass.
N. Y. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Laundry Machines.

Johnson, S. C., Racine, Wis.

Lawn Mowers.

Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.
Coldwell Lawn Mower Co., Newburgh, N. Y.
Dille & McGuire Mfg. Co., Richmond, Ind.
Enterprise Mfg. Co., Philadelphia, Pa.
F. & N. Mfg. Co., Richmond, Ind.
Hensley, M. C., Richmond, Ind.
Mast, Foss & Co., Springfield, O.
Supplee Hdw. Co., Phila., Pa.

Lawn Rakes.

Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.

Lawn Sprinklers.

Blair Mfg. Co., Springfield, Mass.
Enterprise Mfg. Co., Phila., Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Gibbs Mfg. Co., Canton, Ohio.
McGowan, John H. Co., Cincinnati, O.
Portland Lawn Sprinkler Co., Portland, Me.

Lemon Squeezers.

Parker, Chas. Co., Meriden, Conn.
Ripley Mfg. Co., Unionville, Conn.

Letters and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Richardson, C. F. & Son, Athol, Mass.

Locks and Knobs, Manufacturers of.

Dietz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.

Lubricants.

Dixon, Jos., Crucible Co., Jersey City, N. J.

Machinery.

Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. E. & John, Rockford, Ill.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Dey, N. Y.
Birrell & Keeler Mfg. Co., St. Louis.
Bliss, E. W. Co., Brooklyn, N. Y.
Bridgeport Mch. Tool Works, Bridgeport, Conn.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Dietrich & Harvey Mch. Co., Baltimore, Md.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Laight & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Henderer, A. L., Wilmington, Del.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Hubert-Rogers Mch. Co., South Sudbury, Mass.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Co., Cincinnati, O.
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists' Supply Co., Rochester, N. Y.
Manville, E. J., Mch. Co., Waterbury, Conn.
Newark Mch. Tool Wks., Newark, N. J.
New Haven Mfg. Co., New Haven, Ct.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Place, Geo., 145 Broadway, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Pratt & Whitney Co., Worcester, Mass.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mchry. Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfert's Sons, L. F., Philadelphia, Pa.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co. Ltd., Phila.
 Stoney, Frank, Philadelphia, Pa.
 Wetherill, Robert & Co., Chester, Pa.
 Wickes Bros., Saginaw, Mich.
 Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
 Add, Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring, Coes & Co., Worcester, Mass.
 Loyd, John, 558-562 Water St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
 New Britain Hdw. Mfg. Co., New Britain, Conn.
- Machine Tools.—See Machinery.**
- Machine Work.**
 Papping, J., 58th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Mallets.**
 N. Y. Mallet & Handle Works, N. Y.
- Mangles.**
 Johnson, S. C., Racine, Wis.
- Manufacturing Sites.**
 Illinois Central R. R., Chicago, Ill.
- Measuring Tapes.**
 Keuffel & Esser Co., N. Y.
 Lufkin Rule Co., Saginaw, Mich.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
 Rose Polytechnic Institute, Terre Haute, Ind.
- Metals.**
 Pearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metallurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mincing Knives.**
 Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Models, Makers of.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
 Rhodes, L. E. Co., Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
 Graham, John H. & Co., 113 Chambers Street, N. Y.
 Scranton & Co., New Haven, Conn.
 Specialty Mfg. Co., Hartford, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Cumberland Nail & Iron Co., Phila.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
 Valley Steel Co., St. Louis, Mo.
- Nickel Platers' Supplies.**
 Eddy Electric Mfg. Co., Windsor, Conn.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
 Ransom Hdw. Co., Burlington, Vt.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Ct.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oilers.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Stones.**
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Bow Pins.**
 Sawyer, O. C., Sharon, Vt.
- Ox Shoes.**
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Wolf, W. & L., Phila., Pa.
 Shultz Mfg. Co., Phila., Pa.
- Paint.**
 Garry Iron & Steel Roofing Co., Cleveland, O.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Howson & Howson, Philadelphia and Washington.
 Jenner, H. W. T., Washington, D. C.
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 167 William St., N. Y.
- Perforated Metal.**
 Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
 Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pancoast, Henry B. & Co., Phila.
 Saunders' Sons, D., Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**
 Cumberland Nail & Iron Co., Phila.
 Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**
 Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Kelley & McBean, Niagara Falls, N. Y.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Aetna-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 Moorhead, McLean Co., Pittsburgh, Pa.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Bolt & Steel Co., Pottsville, Pa.
 Singer, Ntmick & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, Ohio.
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pokes.**
 Bishop, A. W., Berea, Ohio.
- Polishing Machines.**
 Watson & Stillman, 201 E. 43d, N. Y.
- Post Hole Diggers.**
 Buckeye Mfg. Co., Union City, Ind.
 Gibbs Mfg. Co., Canton, Ohio.
 Wister, L. & R. & Co., Phila., Pa.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 "Silver Finish."
 Tyler Wire Works Co., W. S., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
 Ladin & Rand Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.
- Power Hack Saws.**
 Millers Falls Co., 93 Reade St., N. Y.
- Power Hammers.**
 Denelt & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lingle, Bellefonte, Pa.
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. & Co., Chicago, Ill.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury, Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Pruners.**
 Tolpitt & Ely Co., Elyria, Ohio.
- Pulleys.**
 Brown, A. & F., 17 Day St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
 Lake, J. H. & D. Co., Massillon, O.
- Pulverizing Mills.**
 Bradley Fertilizer Co., Boston, Mass.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Hooker-Corville Steam Pump Co., St. Louis, Mo.
 McGowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pumps, Makers of.**
 Bellevue Pump Co., Bellevue, Iowa.
 Beming Co., Salem, O.
 Dodge, W. & B., Middletown, Conn.
 Mass. Pumps & Co., Springfield, O.
 Myers, F. E. & Bro., Ashland, O.
- Punches.**
 Richards, L. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Henderer, A. L., Wilmington, Del.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 201 E. 43d, N. Y.
- Rails, Old and New.**
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
 Estey, W. S., 65 Fulton, N. Y.
 Ripley Mfg. Co., Unionville, Conn.
- Razors.**
 J. R. Torrey Razor Co., Worcester, Mass.
- Reels.**
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**
 Conroy, P. J. & Co., Philadelphia.
- Rivets.**
 Blake & Johnson, Waterbury, Conn.
 Boyce Rivet Co., Muncie, Ind.
 Burden Iron Co., Troy, N. Y.
 Clark & Cowles, Plainville, Conn.
 Cobb & Drew, Plymouth, Mass.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
 Add, Jno. & Sons, New Haven, Conn.
- Rock Drills.**
 Band Drill Co., 23 Park Place, N. Y.
- Rolling Mill Machinery.**
 Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh.
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
 Trethewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury Conn.
- Rolls, Chilled, Sand and Steel.**
 Birmingham Iron Foundry, Birmingham, C. nn.
 Booth, The Lloyd Co., Youngstown, O.
 East Chicago Fdry Co., Chicago, Ill.
 Garrison, A. Fdry. Co., Pittsburgh, Pa.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Seaman, Sneath & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
- Roofing.**
 Berlin Iron Bridge Co., E. Berlin, Conn.
 Cambridge Roofing Co., Cambridge, O.
 Cincinnati Corrugating Co., Piqua, O.
 Kanneberg Roofing Co., Canton, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
 Keuffel & Esser Co., New York.
 Lufkin Rule Co., Saginaw, Mich.
 Stanley Rule & Level Co., 29 Chambers.
- Rust Preventive.**
 Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
- Sand Paper.**
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
 Caldwell Mfg. Co., Rochester, N. Y.
 Pullman Sash Balance Co., Rochester, N. Y.
 Stearns, E. C. & Co., Syracuse, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 45 Elizabeth, N. Y.
 Ossawan Mills Co., Norwich, Conn.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Pulleys.**
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
 Brown, E. E. & Co., Philadelphia, Pa.
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
 Disston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
 Disston, Henry & Sons, Phila., Pa.
 National Saw Co., 98 Reade St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Vises.**
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Scales, Manufacturers of.**
 Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 55-59 Cliff, N. Y.
- Scrapers, Road.**
 Am. Steel Scraper Co., Sydney, Ohio.
 Kilbourne & Jacobs Mfg. Co., Columbus, O.
 Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screens, Door and Window.**
 Huebner Screen Door Co., Detroit, Mich.
 White, Van Gahn & Co., 15-17 Chatham Sq., N. Y.
 Phillips, A. J. & Co., Fenton, Mich.
- Screw Cutting Machinery.**
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
 Brown, R. H. & Co., New Haven, Conn.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Plate and Pipe Cutter.**
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Wm. H. Haskell Co., Pawtucket.
 Miles, F. S., 205 Quarry, Philadelphia.
 Reynolds & Co., New Haven, Conn.
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
 Barnes, W. F. & John, Rockford, Ill.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Scythe Stones and Whetstones.**
 Pike Mfg. Co., Pike Stat'n, N. H.
 Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**
 Brown, A. & F., 17 Day St., N. Y.
 Cresson, Geo. V. Co., Philadelphia, Pa.
 Fairmount Mch. Co., Philadelphia, Pa.
 Fitzsimons & Co., Cleveland, Ohio.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaft Support.**
 Decatur Shaft Support Co., Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**
 Aetna-Standard Iron & Steel Co., Bridgeport, Conn.
 East Chicago Fdry Co., Chicago, Ill.

Allentown Rolling Mill, Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.

Shears and Scissors.

Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N. J.

Sheet Iron and Steel, Manufacturers of.

Ætna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Chess Bros., Pittsburgh, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Morehead-McCleane Co., Pittsburgh, Pa.
Pierson & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.

Sheet Zinc.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Sinks.

Douglas, W. & B., Middletown, Conn.

Skates, Ice.

Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.

Skates, Roller.

Henley, M. C., Richmond, Ind.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.

Smelting Works.

Reeves, Paul S., 760 S. Broad, Phila.

Soldering Coppers.

Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.

Speaking Tubes.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.

Specialties, Pat. Articles.

Rhodes, L. E. Co., Hartford, Conn.

Spelter.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Missouri Metal Co., St. Louis, Mo.

Spoons and Forks.

Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Kelley & McBean, Niagara Falls, N. Y.
Rogers, The Wm. Mfg. Co., Hartford, Conn.

Sporting Goods.

Hartley & Graham, 313-315 B'way, N. Y.

Springs.

Clark & Cowles, Plainville, Ct.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

Spring Hinges.

Bommer Bros., Brooklyn, N. Y.
Chicago Spring Butt Co., Chicago, Ill.
Fullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.

Stamped Ware.

Am. Stamping Co., 104 & 106 John St., New York.

Stamping Works.

Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.

Staples.

Cobb & Drew, Plymouth, Mass.
Titchener, E.H. & Co., Binghamton, N. Y.

Steam Gauges.

Bristol Co., Waterbury, Conn.

Steam Hammers, &c., Makers of.

Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Tretlow Mfg. Co., Pittsburgh, Pa.

Steam Heating & Oil Separators.

Webster, Warren & Co., Camden, N. J.

Steam Separators.

Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden, N. J.

Steam Specialties.

Lunkenheimer Co., Cincinnati, O.

Steel, Cold Rolled Strip.

Superior Steel Co., Pittsburgh, Pa.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel Figures and Alphabets.

Krogerud, W., 61 Fulton St., N. Y.

Steel Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 41 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Steel (Mushet's Special).

Jones, B. M. & Co., Boston.

Steel Manufacturers.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Hermann & Co., 103 Duane St.
Carbon Steel Co., Pittsburgh, Pa.
Chromer Steel Castings Co., Phila., Pa.
Chromer Steel Works, Erie, Pa.
Crescent Steel Co., Pittsburgh, Pa.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 41 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Morehead-McCleane Co., Pittsburgh, Pa.
Moss, F. W., 83 John, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Bowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburgh, Pa.
Superior Steel Co., Pittsburgh, Pa.
Valley Steel Co., St. Louis, Mo.
Wordlaw, S. & Co., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel, Manufacturers' Agents.

Barns, C. K. & Co., Philadelphia, Pa.
Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.

Steel Rails, Manufacturers of.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.

Steel, Tool.

Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 41 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.

Step Ladders, Rolling.

Bicycle Step Ladder Co., Chicago, Ill.
Coburn, Trolley Track Mfg. Co., Holyoke, Mass.
Croissant, M., Albany, N. Y.
Morley Bros., Saginaw, Mich.

Stocks and Dies.

Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Saunders' Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Stoves, Gasolene.

Standard Lighting Co., Cleveland, O.

Stove Linings.

Ostrander Fire Brick Co., Troy, N. Y.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Working Machinery.

Lincoln Iron Works, Rutland, Vt.

Street Lamps.

Steam Gauge & Lantern Co., Syracuse, N. Y.

Strops.

J. R. Torrey & Co., Worcester, Mass.

Structural Iron Work.

Berlin Iron Bridge Co., East Berlin, Conn.
Lindsay, Jas. G. & Co., Phila., Pa.

Sulphuric Acid.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Tacks, Brads, Staples, &c.

Atlas Tack Corporation, Boston, Mass.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.

Taps and Dies.

Butterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Testing Laboratories.

Riehle Bros. Testing Mach. Co., Philadelphia.

Testing Machines.

Riehle Bros. Testing Mach. Co., Phila.

Theatrical Hardware.

Wollensak, J. F., Chicago, Ill.

Thill Springs.

Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.

Timber and Mineral Lands.

Robertson, E. Co., Cincinnati, O.

Time Record.

Scattergood, H. W., Phila., Pa.

Tin Plate Machinery.

Lloyd Booth Co., Youngstown, Ohio.

Tinware.

Am. Stamping Co., 104 & 106 John St.

Tire Upsetters.

Butts & Ordway, Boston, Mass.

Toe Calks, Steel.

Burke, P. F., Boston, Mass.

Tool Blocks.

Hulburt-Rogers Mch. Co., South Sudbury, Mass.

Tool Chests.

Am. Tool Co., 200 W. Houston St., N. Y.

Tool Holders.

Armstrong Bros. Tool Co., Chicago, Ill.

Tools.

Britton, Horace E., Stoughton, Mass.
Brown, R. H. & Co., New Haven, Conn.
Mayhew, H. M. Co., Shelburne Falls, Mass.
Miller Falls Co., 93 Reade, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers.
Starratt, L. S., Athol, Mass.
Wilkinson, A. J. & Co., Boston, Mass.

Tools, Blacksmith and Wheelwright.

Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Tools, Steam and Gas Fitters'.

Saunders' Sons, D., Yonkers, N. Y.

Torches, Oil and Gasoline.

Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.

Transom Litters.

Wollensak, J. F., Chicago, Ill.

Tricycles.

Toledo Metal Wheel Co., Toledo, Ohio.

Trucks, Manufacturers of.

Clark, G. P., Windsor Locks, Conn.

Tubes, Seamless Drawn Copper.

Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.

Tubes, Steel.

Leah's, John S. Son & Co., 4 Fletcher St., New York.
U. S. Projectile Co., Brooklyn, N. Y.

Tumbling Barrels.

Henderson Bros., Waterbury, Conn.

Turnbuckles.

Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.

Twist Drills, Makers of.

Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.

Valves, Gas, Water and Steam.

Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
Lunkenheimer Co., Cincinnati, O.
McNab & Harlin Mfg. Co., 66 John, N. Y.

Ventilator Appliances.

Howard & Morse, 16 Fulton St., N. Y.

Vise Jaws.

Newark Mch. Tool Co., Newark, N. J.

Vises.

Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Miller Falls Co., 93 Reade St., N. Y.
Pentiss Vise Co., 14 Barclay, N. Y.

Wagon Jacks.

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.

Washers.

Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.

Washing Machines.

Benbow Mfg. Co., St. Louis, Mo.

Water Meters.

Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Water Wheels.

Poole, Robt. & Son Co., Baltimore, Md.

Wheelbarrows.

Amer. Steel Scraper Co., Sidney, Ohio.
Byran Mfg. Co., Byran, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Sidney Steel Scraper Co., Sidney, O.

Window Cleaners.

Bourke Mfg. Co., Youngstown, O.

Window Cord, Makers of.

Samson Cordage Works, Boston, Mass.

Wire, Manufacturers of.

Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 93 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Wire Cloth.

Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.

Wire Cutters.

Higganum Hdw. Co., Higganum, Conn.
King, J. M. & Co., Watertown, N. Y.

Wire Dies.

McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John St., N. Y.

Wire Fences, See Fencing, Iron and Wire.

Wire Goods, Manufacturers of.

Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow Saylor Wire Co., St. Louis.
Ossawann Mills Co., Norwich, Conn.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, C. T., Wire Novelty Co., Newark, N. J.
Wire Goods Co., Worcester, Mass.

Wire Machinery.

Am. Tool Wks., Cleveland, O.
Marville, E. J. Mch. Co., Waterbury, Ct.
Morgan Construction Co., Worcester, Mass.
Waterbury Mch. Co., Waterbury, Conn.

Wire Straightening and Cutting Machinery.

Adt, John & Son, New Haven Conn.

Wire Nails.

Bond Nail Co., Raynham, Mass.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Phillips, Townsend & Co., Phila., Pa.
Salem Wire Nail Co., Salem, O.
Taunton Wire Nail Co., Taunton, Mass.
Whitney, A. R. & Co., New York City.

Wire Rods, Steel.

New Castle Wire Nail Co., New Castle, Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Wire Rope, Iron and Steel.

Makers.
Broderick & Bascomb Rope Co., St. Louis, Mo.
California Wire Works, San Francisco.
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
Williamsport Wire Rope Co., Williamsport, Pa.

Wire Rope Machinery.

Kay, J. F., Passaic, N. J.

Wood-Working Machinery.

Fay, J. A. & Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Wilkinson, A. J. & Co., Boston, Mass.

Wrenches, Manufacturers of.

Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn.
Coes Wrench Co., Worcester, Mass.
Trimont Mfg. Co., Roxbury, Pa.
Watworth Mfg. Co., Boston, Mass.
Williams, J. H., Brooklyn, N. Y.

Wringers.

Colby Wringer Co., Montpelier.
National Wringer Co., Canton, O.

Yacht Hardware.

Ferdinand, L. W. & Co., Boston, Mass.

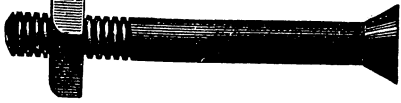
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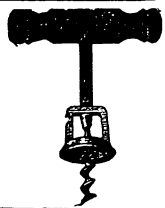
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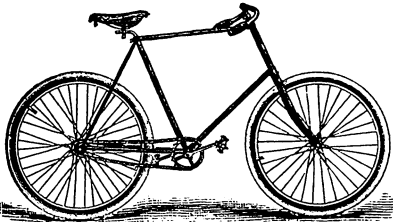
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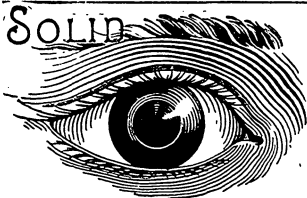
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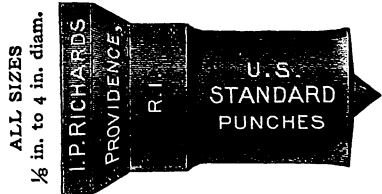
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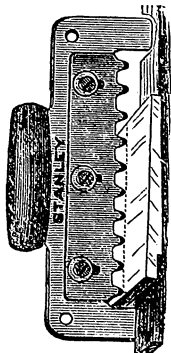
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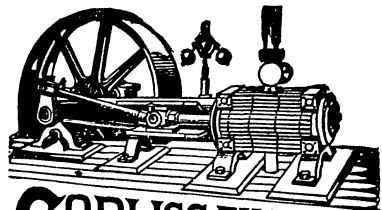


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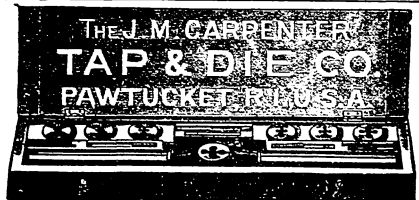
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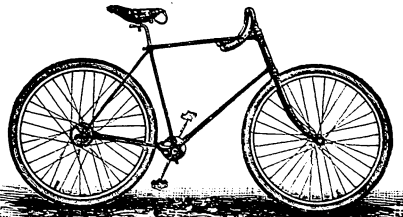
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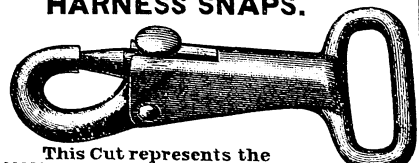
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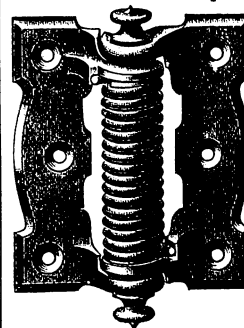
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THE IRON AGE

THURSDAY, MAY 10, 1894.

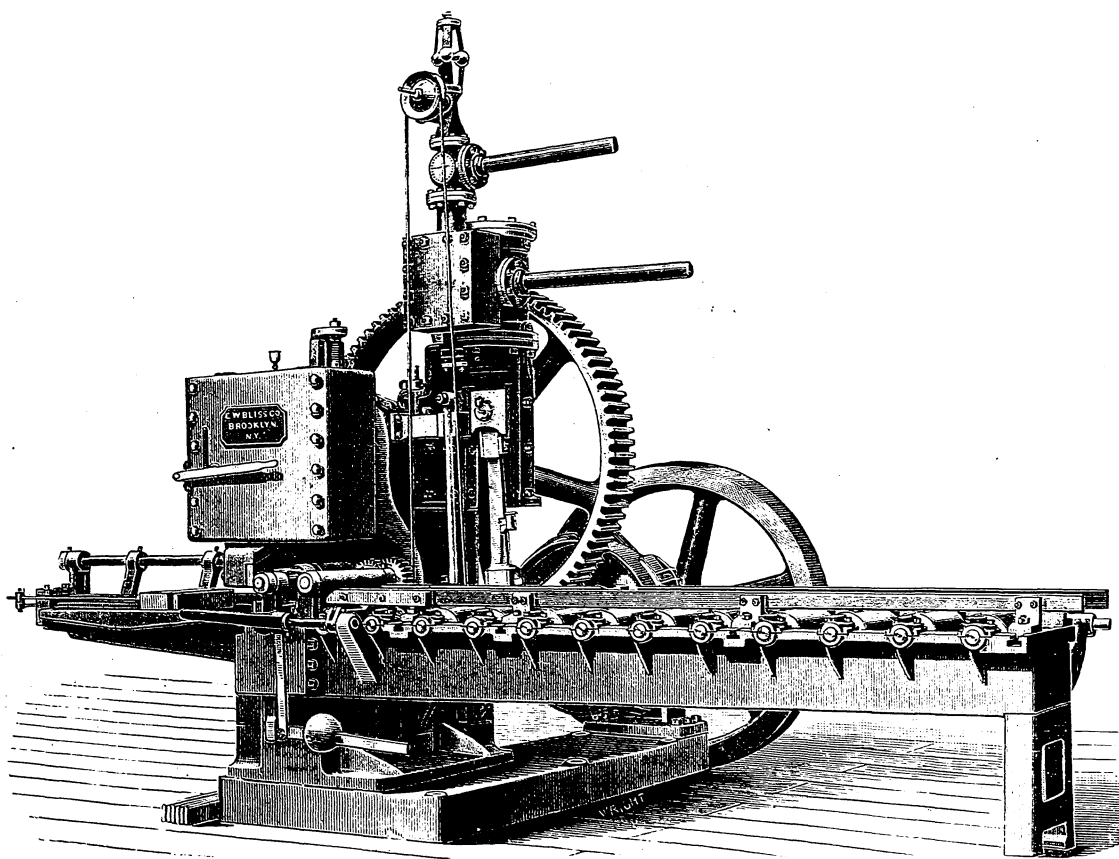
The Bliss Automatic Muck Bar and Billet Shear.

In the process of rolling steel into thin sheets it would be impracticable to roll each sheet separately, as it would not retain its heat, and the following method is adopted: A billet of steel of sufficient size to make a large number of sheets is heated and passed a number of times through a train of rolls, each pass lengthening the bar and reducing its size. It leaves these rolls in the form of a bar 20 or 30 feet long and about 1 inch thick by 8 inches wide, these dimensions depending upon the size and gauge of the sheets to be made. These

mines the length of the pieces, and pass the bar along by hand for the successive cuts. This method not only requires the labor of several men to handle the bar, but calls for considerable skill on the part of the shearman, and unless great care is used the results are liable to be unsatisfactory.

The illustration represents a machine designed by the E. W. Bliss Company of Brooklyn, N. Y., for doing this work automatically, only one man, who need not be a skilled shearman, being required to handle the machine. The machine consists of a powerful gate shear driven directly by an engine. A clutch is attached to the engine shaft, which can be operated either by hand

by throwing the clutch into operation by means of the hand lever shown in the cut at the front of the cutter housing. When the forward end of the bar has been squared, the operator raises the clamp lever and the bar feeds forward. An adjustable gauge is placed in its path, and upon striking this its progress is arrested and the clutch is automatically thrown into operation, causing the upper shear blade to descend and cut off the first length. As soon as this occurs the piece drops out, the shear blade ascends to its upper position and stops, while the bar again feeds forward, and the operation is repeated until the bar is all cut to lengths. By this system the bars are cut accurately, and as



THE BLISS AUTOMATIC MUCK BAR SHEAR.

bars, technically known as the muck bars, are cut up into uniform lengths, and each piece is then repeatedly re-rolled and folded over, each rolling operation reducing the thickness and increasing the linear dimensions, and each folding doubling the number of sheets in the final pack. After the last rolling the ends of the pack are sheared. It is very important that the pieces into which the muck bar is cut should be of uniform size and squarely cut, as upon this depends the size and form of the subsequent pack, and it will easily be seen that any error will be largely exaggerated with the successive passes through the rolls. The method heretofore employed for shearing the muck bar has been to carry the bar to the old fashioned alligator shear, place the end against a fixed gauge, which deter-

or automatically. To the right of the machine is a carrier composed of a train of rolls driven continuously. The muck bar coming hot from the rolls is placed upon these carriers, which propel it toward the cutters between side gauges, which keep it in position at right angles to the shear blades. Just before entering between the cutters a pair of feed rolls take hold of the bar so as to feed it positively. A clamping device is placed in the path of the bar, and so arranged with a lever that the progress of the bar may be arrested by the operator. This lever also controls the feed rolls, so that when the clamps are in contact with the bar the rolls are removed from it, and *vice versa*. This arrangement gives the operator control over the bar, and he is enabled to bring it into proper position to square off the ragged end

rapidly as they come from the rolls. In order to adapt the machine to the practical requirements of mill work, experiments were conducted for some time by the makers at the mills of the Canonsburgh Iron & Steel Company, and this machine is the outcome of these experiments. There are several of these machines in operation, one of them having been recently purchased by the St. Louis Stamping Company.

Western Foundrymen's Association.—The annual meeting of the Western Foundrymen's Association will be held on Wednesday, May 16, at 7.30 p.m., in Room 701, Western Union Building, Chicago. The business of the meeting will include the election of officers for the ensuing year. Two papers will be

presented—one by H. L. Hollis, on the "Chemical Differences of Some Russian, German and American Castings," and one by Thos. D. West, embodying his ideas regarding the test bar.

British and American Hardware and Implements.

[From an English Correspondent.]

The British manufacturer of machine tools, machinery and agricultural implements has now to face the fact that his most powerful and most dangerous rival in foreign markets—for the supply of the better kind of machine tools, implements and hardware generally—is the American manufacturer of these goods. I do not think that any one who has watched the course of events in this connection during the last decade can doubt this assertion, and I propose to lay before the readers of this journal some facts bearing directly on the question of this foreign trade and the competition between the two nations.

For instance, take a case which has just come to the notice of the London Foreign Office. The English representative of our Government in Honduras has just sent home a dispatch which is most significant of the existing state of affairs in that country. He points out that it is true that American manufacturers have succeeded in attracting the attention of Honduran purchasers to various kinds of American goods; "but it is in the machinery and general ironmongery (hardware) line that American manufacturers are making the greatest inroads" into British trade. Most of the exports from America to Honduras consist of mining machinery, steam boilers and engines, pumps, saw mills and wood working machinery. The majority of the mining enterprises in Honduras being in the hands of Americans, it is natural that those in charge of the mines should prefer American machinery. Apart from this self evident fact, however, I would call special attention to what the English official says: "But what is surprising is the fact that English and French mining companies here have, after erecting English machinery, abandoned it and purchased complete or partial American outfits. I am assured that price has in nowise entered into consideration in such changes, and that adaptability to the work required and economy in the performance of the same after erection are the prime and, in fact, the only factors."

Is it possible, asks this gentleman in plaintive tones, that our manufacturers cannot make mining machinery that will compete to advantage with like machinery made in the United States? I cannot, he says, bring myself to believe such to be the case, but when I see steamer after steamer, month after month, unloading tons upon tons of American machinery at Honduras I cannot help believing that there is a business deficiency somewhere on the part of our manufacturers. The same is beginning to be the case regarding edged tools. In former years Honduran artisans were content with almost any kind of axe, saw, plane or former chisel, providing the price was sufficiently low to please them, but they now begin to demand a better class of tools and seek quality regardless of price. American edged tools appear to be prominent as regards quality and temper. To show the value of this market to American manufacturers, I

may add that the United States exported in 1893 to the Central American States and British Honduras no less than \$98 599 worth of builders' hardware, saws, tools, &c., while of agricultural implements she sent \$12,100 worth. So much for Honduras. Let us turn now to the African continent and see what is going on in Loanda—Portugal's most important colony. There we find that the machinery for distilling, hulling coffee and other purposes is nearly all American. Here again we have the evidence of an English official, who, writing from Loanda to the Foreign Office on January 20 last on the question of the machinery trade there, said: "The latest importations have come from the United States. A smart young engineer who could speak Spanish and who, therefore, easily picked up a little Portuguese was sent out by his firm to make a tour of the provinces to ascertain by personal inspection the requirements of the coffee estates, to make suggestions, take measurements, explain catalogues and to offer adaptations in all cases where the advertised contrivance did not seem to be all that was desired. Naturally the result was a series of orders." This expert says that many of the buyers referred to were quite satisfied with the machinery, saying that it was "excellent." But apart from the question of the quality of the goods there can be no doubt as to the venture being a credit to American enterprise.

Before leaving this question of American vs. English tools, &c., I ought not to omit to refer to an attempt which was made some little time ago by the Governor of British Honduras (Sir Alfred Moloney) to reintroduce British tools and hardware into that colony. He appealed to English manufacturers not to let the trade slip from their grasp. Not many years back and before direct trade was established between British Honduras and the United States, the tools necessary in British Honduras were of English manufacture; and he stated that "the United States have rivaled us successfully in such trade, and have more or less beaten us out of the market. True, there are a few English tools not yet replaced therefrom, but the majority of implements come thence." The Governor sent home a collection of American made axes, cutlasses and similar articles, asking that the samples should be brought to the notice of British hardware firms. Up to the present time, however, I have not heard that the experiment has had any practical results.

Before closing this communication I may say a word about the rivalry now proceeding between the English and American makers of agricultural machinery. The result of this contest can best be seen in such a country as the Argentine Republic. Until within recent years England controlled the bulk of the trade in such implements. To-day, however, the majority of the reapers, winnowing and sowing machines, plows, rakes and forks used in Argentina are of American make. This is mainly due to the fact that the American implements are much lighter, more durable, do more work with less labor, and are made with more mechanical skill than the English implements. In fact, the weighboard of an English weighing machine is said to weigh as much as the American machine. As a rule, the difference in the draft of a common English and American iron plow is two to one in favor of the latter when doing similar work. But perhaps the most eloquent testimony to the

practical value of the American implements lies in the fact that the United States exports thither of such goods in 1893 amounted to \$1,703,239, a considerable increase on 1892, while the shipments thither from the United Kingdom in the same year were \$171,016 in value. Taking these and the other facts adduced, further comment is needless.

The Chapin Iron Mine Resumes.

A press dispatch from Iron Mountain, Mich., dated May 2, states that for the first time in eight months the Chapin Mine whistle blew, announcing that the management was ready to resume work at the property, idle since last summer. The news had a tenfold significance to the community, burdened since last August with 2500 people compelled to exist on public charity.

Trustee Flannagan and Superintendent McNaughton said that to M. A. Hanna of Cleveland is due the credit for placing the mine once more on the producing list. He not only furnished money with which the miners were paid when the mine was closed, but he has persistently sought to perfect arrangements for reopening it, even when the outlook was darkest. Some days ago he secured an option on a controlling interest, and authorized Superintendent McNaughton to at once begin employing miners.

To begin with, 500 men will be employed, preference being given to married men and former employees.

It is announced that Mr. Chapin, fee owner of the mine, is associated with Mr. Hanna and has agreed to waive all claims to royalties, which have heretofore yielded him 75 and 35 cents a ton.

The opening of the mine takes the people off the Relief Committee's hands and solves the question of the future existence of families supported by charity.

In connection with this news comes an interesting statement from Milwaukee. Last week when some 6000 odd shares of Chapin Mine stock were knocked down at auction the price per share was a fraction more than 10 cents. On the 2d inst. Washington Becker, president of the Marine Bank, disposed of 40,007 shares, six shares more than a controlling interest, at \$1 per share, an increase of 90 cents within the week. The stock was purchased in a lump by A. M. Helmer, acting as the broker for unknown parties.

Results of Boiler Tests.

The accompanying table shows the results of a number of very exhaustive boiler tests made in and near Chicago during the past year by the Robert W. Hunt & Co. bureau of inspection, tests, &c., The Rookery, Chicago. These tests were made on boilers in actual operation in all kinds of service. Some are in railroad shops, others in breweries, electric light plants, pumping stations, office buildings, &c. The boilers are also of various types, but mainly horizontal tubular. Comparisons are made with furnaces of different kinds—plain, steam jet, down draft, &c. The fuel used was in some cases screenings, in others block coal, and in still others oil, as stated in the table. The coal was bituminous. The results shown, as to amount of evaporation and cost of power, are extremely interesting and will, no doubt, prove of value to those who are conducting investigations in the same line on their own account.

In this connection a series of tables published in *Electrical Engineering* for April are of much interest. They were

and are used in determining the cost of generating steam in plants of various sizes and fired with either coal or oil.

Cost of Evaporating 1,000 Pounds of Water.—Fuel: Coal.

(Robert W. Hunt & Co.'s Table No. 1.)

Coal per ton.		\$0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00
Pounds of water evaporated per pound of coal.	5.	\$0.0750	1.000	1.250	1.500	1.750	2.000	2.500	3.000	3.500	4.000
	5.5	.0681	.0909	.1136	.1363	.1591	.1818	.2272	.2727	.3182	.3636
	6.	.0625	.0833	.1041	.1250	.1458	.1666	.2083	.2500	.2916	.3333
	6.5	.0576	.0769	.0961	.1154	.1346	.1538	.1923	.2307	.2692	.3077
	7.	.0530	.0714	.0892	.1071	.1250	.1428	.1785	.2143	.2500	.2857
	7.5	.0488	.0666	.0833	.1000	.1166	.1333	.1666	.2000	.2333	.2666
	8.	.0441	.0625	.0781	.0937	.1093	.1250	.1562	.1875	.2187	.2500
	8.5	.0410	.0588	.0735	.0882	.1029	.1176	.1470	.1764	.2059	.2353
	9.	.0394	.0552	.0699	.0833	.0972	.1111	.1389	.1666	.1944	.2222
	9.5	.0375	.0500	.0625	.0750	.0875	.1000	.1250	.1500	.1750	.2000
	10.	.0357	.0476	.0595	.0714	.0833	.0952	.1190	.1428	.1666	.1904
	10.5	.0340	.0454	.0568	.0681	.0795	.0909	.1136	.1360	.1591	.1818
	11.										

Cost of evaporating 1,000 pounds of water = $\frac{\text{price of coal per ton}}{(2) \times \text{evaporation.}}$

Cost of Evaporating 1,000 Pounds Water. Fuel: Oil.

(Robert W. Hunt & Co.'s Table No. 2.)

Cost per barrel of 42 gallons.		\$0.20	.30	.40	.50	.60	.70	.80	.90	1.00
Cost per 100 gals. of oil...		\$0.4762	.7142	.9524	1.1904	1.4275	1.6666	1.9047	2.1427	2.3819
Cost per lb. of oil.....		\$0.0006802	.0010203	.0013605	.0017006	.0020407	.0023809	.002721	.0030611	.0034013
Pounds water evap. per lb. of oil.	10	\$0.0680	.1020	.1360	.1700	.2040	.2381	.2721	.3061	.3401
	11	.0618	.0927	.1236	.1546	.1855	.2164	.2473	.2782	.3091
	12	.0566	.0850	.1133	.1417	.1700	.1984	.2267	.2551	.2834
	13	.0523	.0784	.1046	.1306	.1569	.1831	.2093	.2354	.2616
	14	.0485	.0728	.0971	.1214	.1457	.1700	.1943	.2186	.2429
	15	.0453	.0680	.0907	.1133	.1360	.1587	.1814	.2040	.2267
	16	.0425	.0637	.0850	.1062	.1275	.1488	.1700	.1913	.2125
	17	.0400	.0600	.0800	.1000	.1200	.1400	.1600	.1800	.2000
	18	.0377	.0566	.0755	.0944	.1133	.1322	.1511	.1700	.1889
	19	.0358	.0537	.0716	.0895	.1074	.1253	.1432	.1611	.1790
	20	.0340	.0510	.0680	.0850	.1020	.1190	.1361	.1530	.1700

42 × 7 = 294 = pounds of oil per barrel.

Let x = cost per barrel. Cost of evaporating 1,000 pounds water = $\frac{1,000}{\text{evaporation}} \times \frac{x}{294}$

Approximate Cost of the Labor Required in Evaporating 1,000 Pounds of Water. Fuel: Coal.—One Boiler Horse-Power Equals 34½ Pounds of Water from and at 212°.

(Robert W. Hunt & Co.'s Table No. 3.)

Horse-power of boiler.	Number of boilers in battery.									
	1	2	3	4	5	6	7	8	9	10
75	\$0.06194	.03097	.01548	.03097	.03593	.03417	.04425	.03872	.04061	.04264
100 .....	.04645	.02322	.02941	.02322	.02694	.02379	.03318	.02901	.03045	.03205
200 .....	.02322	.01161	.01471	.01688	.01347	.01471	.01957	.01712	.01754	.01811
300 .....	.01548	.01471	.01032	.01471	.01827	.01522	.01526	.01509	.01514	.01502
400 .....	.01161	.01161	.01122	.01393	.01370	.01509	.01459	.01408	.01380	.01242
500 .....	.01765	.01347	.01466	.01347	.01635	.01517	.01552	.01474	.01507	.01430
600 .....	.01471	.01122	.01288	.01296	.01362	.01380	.01294	.01318	.01256	.01261

Cost of labor per month

26 days × 12 hours × No. of boilers × No. of thousand lbs. of water evap. = approx. cost.
[The above table is figured for a day of 12 hours. If cost is wanted for eight-hour day, add one-half more to given amount in table. The wages are calculated as follows: Firemen, \$50; coal passer, \$45; water tender, \$5.]

Approximate Cost of Labor Required in Evaporating 1,000 Pounds of Water. Fuel: Oil.—One Boiler Horse-Power Equals 34½ Pounds of Water from and at 212°.

(Robert W. Hunt & Co.'s Table No. 4.)

Horse-power of boiler.	Number of boilers in battery.									
	1	2	3	4	5	6	7	8	9	10
75	0.06194	0.03097	0.02064	0.01548	0.01239	0.02048	0.01755	0.01536	0.01365	0.01228
100	0.04645	0.02322	0.01548	0.01161	0.00929	0.01316	0.01316	0.01152	0.01024	0.00921
200	0.02322	0.01161	0.00774	0.00564	0.00464	0.00658	0.00658	0.00576	0.00512	0.00460
300	0.01548	0.00774	0.00516	0.00387	0.00309	0.00438	0.00438	0.00384	0.00341	0.00307
400	0.01161	0.00580	0.00387	0.00290	0.00232	0.00329	0.00329	0.00288	0.00256	0.00230
500	0.00929	0.00464	0.00309	0.00232	0.00185	0.00263	0.00263	0.00230	0.00204	0.00184
600	0.00774	0.00387	0.00258	0.00193	0.00155	0.00219	0.00219	0.00192	0.00170	0.00153

Cost of labor per month

26 days × 12 hours × No. of boilers × No. of thousand lbs. of water evap. = approx. cost.
[The above table is figured for a day of 12 hours. If cost is wanted for eight-hour day, add one-half more to given amount in table. The wages are calculated as follows: Fireman, \$50 per month; water tender, \$55.]

prepared under the direction of J. C. McMyinn, of Robert W. Hunt & Co.,

Table No. 1 gives the cost of evaporating 1000 pounds of water, using

coal as fuel, the price of the coal varying from 75 cents to \$4 per ton, and the evaporation per pound of coal ranging from 5 pounds to 11 pounds of water. To use this table it is only necessary to know the cost of the coal used and the evaporation secured to readily calculate what the fuel bills should average. It is interesting to note that coal at \$4 a ton, with an evaporation of 11 pounds of water per pound of coal, is more expensive than coal at \$1.75 per ton, evaporating only 5 pounds of water.

Table No. 2 gives the cost of evaporating 1000 pounds of water, using oil as fuel, the price of oil varying from 20 cents per barrel to \$1 per barrel, and the evaporation from 10 pounds to 20 pounds of water per pound of oil. According to this table, oil having an evaporative power of 14 pounds of water per pound of oil, and costing 40 cents per barrel, will compete with coal at \$1.50 per ton, where the latter evaporates 8 pounds of water per pound of coal, and disregarding the question of labor.

Table No. 3 gives the approximate cost of labor to evaporate 1000 pounds of water when coal is used as fuel. This table is compiled from data obtained by Robert W. Hunt & Co. in some 75 boiler trials, and also from information obtained in answers to inquiries addressed to prominent steam producers. Of course, practice varies largely in regard to the number of men necessary to fire boilers, and this table only gives a fair average of common practice. I have supposed that a fireman could handle about 1 ton of coal per hour. The horse-power of the boilers is taken at 75, 100, 200, 300, 400, 500 and 600, and the number of such boilers in a battery ranges from one to ten. Suppose a station has five boilers and they are developing 200 horse-power each, the labor for twelve hours (fireman \$50 per month, coal passer \$45, and water tender \$55 per month of 26 days) for every 1000 pounds evaporated would cost \$0.01347; and suppose \$1.50 coal was being used with an evaporation of 7 pounds water per pound coal, the total cost of evaporating 1000 pounds of water would be \$0.1071 + \$0.0134, or \$0.1205.

Table No. 4 gives the cost of labor necessary to fire boilers with oil, using the same units as in Table No. 3. Suppose, as in the former case, that a station has five boilers developing 200 horse-power each. From Table No. 4, the cost of labor for each 1000 pounds water evaporated is \$0.00464. Now, from Table No. 2, taking oil at 70 cents per barrel and evaporating 15 pounds of water per pound of oil, the total cost in using oil would be \$0.1587 + \$0.0046, or \$0.1633, as against \$0.1205 with coal as fuel.

But to take another example: Suppose a plant has ten boilers and each develops 400 horse-power with coal at \$4 per ton, and an evaporation of 10 pounds water per pound of coal, the total cost would be \$0.2000 + \$0.0124, or \$0.2124, for every 1000 pounds of water evaporated. The cost in the same plant, using oil at 70 cents per barrel, and an evaporation of 15 pounds, would be \$0.1587 + \$0.0023, or \$0.1610, a saving in favor of oil as fuel.

From these tables I trust any one interested can easily calculate which fuel is the most economical for his particular case, and in designing new stations an intelligent opinion can be formed regarding the units of boiler power which shall prove both most economical and most convenient.

The Chicago Stamping Company.

Recent additions have been made to the plant of the Chicago Stamping Company, rendering it a very much more complete establishment in every department. The works are now so extensive that they rank among the largest of the kind in the country. They occupy almost an entire city block, bounded by Congress, Green, Harrison and Peoria streets in the west division of the city of Chicago. This is graphically shown by reference to the accompanying diagram giving a ground plan of the works. The only portion of the block not included in the company's plant is the northwest corner.

These works were established by Frank Sturges & Co. in 1865. That firm erected a three-story building 100 by 30 feet on a portion of the present site. From this comparatively small beginning has gradually grown the im-

occupy the intervening ground and are of irregular height.

Until last year the company maintained a store on Lake street in the heart of the business section of Chicago, but at that time their new store building was finished and the offices were then removed to and consolidated with the works, greatly improving the shipping facilities, avoiding the frequent handling of goods, and enabling orders to be filled with much greater promptness.

The works may be said to be divided into two grand departments, of which one is devoted to house furnishing goods and the other to specialties, such as cans, grocers' goods, milk cans, milk can trimmings and stock.

The company manufacture their own raw material as far as possible. They have their own tin plate plant, in which they produce a large proportion of the tin plates required for their consumption. This department was started

together with a great number of small presses for cutting up tin plates for small ware and drawing all descriptions of small articles and miscellaneous work.

A peculiar feature of this establishment is that all the metal cutting for the works is done in one place, the stock then being distributed to the different departments in which it is finally worked up. In this way the cutting is economically done, insuring a minimum waste of tin plate. The importance of this feature will be realized when it is known that between 3000 and 4000 different articles are constantly in process of manufacture. The machine shop for making all the dies and special machinery is equipped with the latest kinds of planers, drills, lathes, &c. It is a complete die and tool shop, but is run exclusively on the company's own work.

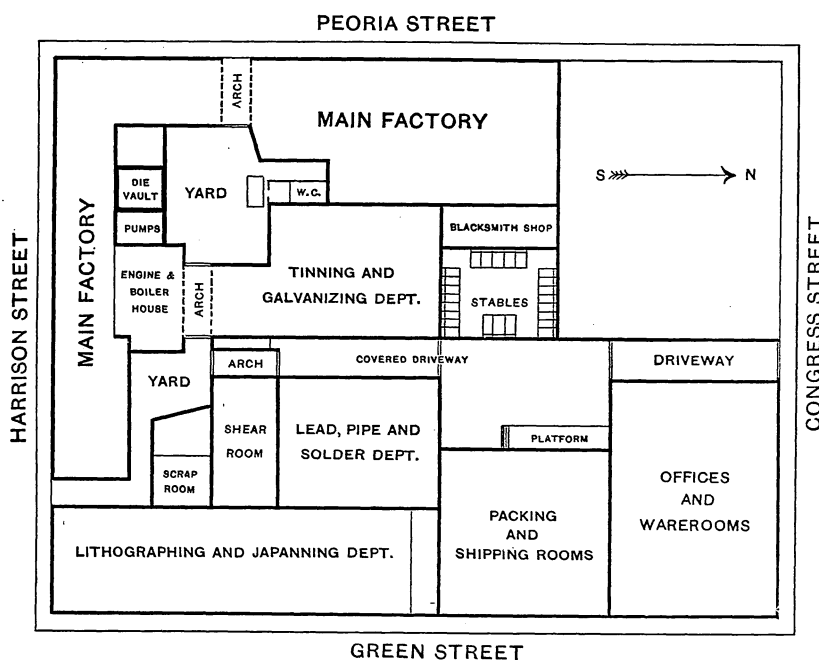
This concern was one of the first in the country to make stamped milk cans, and are now very prominent in the manufacture of milk cans and dairy supplies. They make a very great variety of milk cans, as each section of the country has its own peculiar pattern, and the company's business extends over the entire area. This department, which is under the management of W. H. Burn, formerly secretary of the Buhl Stamping Company of Detroit, is an important branch of the establishment, and is located on the ground floor of the main factory. Here milk cans are manufactured in large quantities for stock, so that the demand for made up cans can be promptly supplied. A large force of hands is also regularly employed in making up trimmings to supply the demand for this class of work.

The second, third and fourth floors of the main factory building are devoted to pieced tinware and can work, such as paint cans and miscellaneous tinware. The tinner's department for sheet iron and galvanized iron work and heavy tin work is also in this part of the establishment.

All stamped ware is retinned in a retinning shop operated in close connection with the tin plate department. It contains a number of stacks, additions to which are being made which will considerably increase its facilities. Retinning requires peculiar skill on the part of the workmen, and consequently the highest priced labor is found in this shop. An important department of the works is the galvanizing shop, which is also operated in connection with the tinning house. Galvanized ware, such as coal hods, buckets, &c., is first made of black iron and is galvanized afterward.

A special department is devoted to the manufacture of lead pipe and solder. It is equipped with the necessary machinery for manufacturing all sizes of lead pipe, from 4-inch down to ½-inch. Here large quantities of solder are also made for the general trade. It is the intention to make the manufacture of lead pipe and solder more conspicuous hereafter.

An extensive shop has been fitted up for lithographing tinware and japanned ware, including not only staple articles known to the trade, but a large amount of specialties, such as advertising signs, druggists' boxes, tea caddies, &c. Three power presses are constantly in operation on lithographic work. In close connection with the printing department is the japanning department, in which are a number of large baking ovens heated by steam. The company also have a nickel plating plant, in which they nickel plate all portions of their product requiring such treatment.



PLAN OF THE WORKS OF THE CHICAGO STAMPING COMPANY.

portant enterprise which is the subject of this article. The incorporation of the company dates from 1876. Frank Sturges, the founder of the company, still retains his connection with it, and is at present one of the board of directors. His son, Lee Sturges, became connected with the establishment in February, 1886, and is now president. Under his management the progress of the company has received increased impetus, judicious alterations have been made in the plant and its scope has been very greatly enlarged. W. M. Conger, now vice-president and secretary, was the late owner of the Newark Tea Tray Company of Newark, N. J., and first made the manufacture of high grade tea trays a success in this country. He was also the first inventor of machinery for successfully manufacturing stove boards.

The buildings erected on the block above referred to vary in height from one to four stories. The main building of the factory is at Harrison and Peoria streets and is four stories high. The store building is diagonally opposite, on the corner of Congress and Green streets, and consists of four stories and a basement. The tin shops, stables, machine shops, stamping rooms, &c.,

about the beginning of the present year, and now has three automatic tinning machines, to which more will soon be added. Contracts have already been placed for the additional machines, some of which are intended for tinning very large and heavy plates for milk cans. The capacity of the machines now in operation is from 800 to 1000 boxes per week. It is the intention of the company ultimately to not only make all the tin plates required for their own consumption, but also to manufacture for the open market. At present black plates are purchased from outside manufacturers, but the erection of a rolling mill at some convenient point is contemplated, and it would probably have been begun before this time if the question of tariff duties had been favorably settled.

The stamping department contains one of the largest presses in the world. Thus far only two of these large presses have been built. It is of the Stiles & Parker make, takes a 5-foot blank, weighs 65 tons and stands 18 feet high from the floor. It is used for very heavy work, pressing sheets up to the heaviest gauges. Other large drawing presses are in this department, which are used for dish pans and large work,

The line of house furnishing goods manufactured by the Chicago Stamping Company covers everything made by establishments of this kind. In addition, they turn out any kind of special work in sheet metal ware; for instance, they have an important trade in agricultural implement seats made of stamped metal, which are being used in place of the old style heavy cast iron seats. The special boxes made for the use of druggists and others are of infinite variety and sizes, some having been turned out as small as a nickel.

The store building has been well arranged for offices and warehouse purposes. The offices on the first floor are handsomely furnished. A portion of the same floor is used for a sample room. The store and sales department are under the management of W. L. Goodrich, who has been actively identified with the tinware trade of the West for the last 25 years. The upper floors of this building are devoted to storage purposes, carrying at all times a full stock of kitchen and house furnishing goods. The company's trade covers the whole country from the Atlantic to the Pacific oceans and to the extreme South. They have built up a large Eastern as well as a Western trade. To meet the requirements of such a business and to hold the trade by prompt shipments, it is essential that very large stocks of goods should be constantly carried. Heretofore they have done a large jobbing business in connection with their business as manufacturers, but the rapid growth of their factory trade has now compelled them to discontinue the handling of outside goods and they will confine their attention almost exclusively to their own products.

World's Fair Dividend.

The directors of the World's Columbian Exposition, at Chicago, declared a 10 per cent. dividend to stockholders May 1. The following is the report offered by Chairman Peck of the finance committee:

Your committee on finance beg leave to report that they have carefully examined the report of the auditor showing the assets and liabilities of the corporation, and that at a meeting of the committee held for that purpose, at which were present the acting auditor and the solicitor-general, a most thorough examination was made of the present financial condition of the World's Columbian Exposition. It was found that the known assets were as follows:

Cash in Chicago banks April 28.....	\$1,069,808.47
Souvenir coins at par.....	158,150.50
Cashier's petty cash fund.....	4,000.00
City of Chicago warrants applicable in payment of dividend.....	254,403.71
Total.....	\$1,486,362.68
Fully paid up stock, including appropriation of city of Chicago.....	\$10,504,260.00
Ten per cent. of same.....	1,050,426.00
Balance.....	\$435,936.68

There are negotiations pending with concessionaires which will result in additional collections; and there are outstanding unadjusted claims, and also suits pending in the courts against your corporation.

After careful consideration of these and consultation with the solicitor-general, your finance committee feel confident that the net liabilities cannot reach the balance on hand over and above that required to pay the dividend of 10 per cent. on the full paid capital stock.

The Foundrymen's Association.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club, in Philadelphia, on Wednesday, the 2d inst., with a good attendance of members. The president, Francis Schumann of the Tacony Iron & Metal Company, Philadelphia, occupied the chair. The reading of the minutes of the last meeting was dispensed with.

The Executive Committee reported the proceedings of its last meeting. Its members believed that the discussions on "Chemistry for Foundry Practice" would bring about good results finally, but they thought the subject a little too deep for the average foundryman, as he did not understand the matter from a chemical point of view. He selected his iron by fracture and general appearance, and then found out how strong it was by the use of a testing machine, as all specifications of orders for castings were given out subject to strength. The foundryman, as a rule, had not found it necessary to go to the expense of employing a chemist. How long such a condition would last they did not know, but it seemed that sooner or later they would follow in the footsteps of car wheel and steel manufacturers, whose entire success had been brought about by chemists.

A paper on "The Erratic Square Test Bar: A Study of the Physical Analysis of Cast Iron," was then read by Thos. D. West. The paper was as follows:

The Erratic Square Test Bar—Comparison and Study of Phenomena in Cast Iron.

Mr. Keep's papers, read before this association April 4 and the Western Association March 28, 1894, chiefly originated through an article which the writer prepared for the *Iron Trade Review* in answer to an inquiry by a correspondent of that paper as to the cause of variations in the strength of test bars taken from the beginning and end of heats. It was claimed that those taken from the latter end were always the strongest. My answer was that the strength of bars at the different ends of the heat depended altogether on the character of the metal used, and that the correspondent's cupola worked colder at the latter part of the heat. Hence it did not liberate so much sulphur, or the iron absorbed more of it, and in doing so promoted the formation of combined carbon, which with decreased silicon is the cause of increased strength.

Now, Mr. Keep says at the commencement of his Western article, referring to the above: "We shall prove that the difference is caused by the variation in heat at which the iron is melted, not the heat of the iron when it was put into the mold," and then further down turns "about face" to prove by four test bars, poured "all from one ladle of 28 pounds cupola iron," that it is not the heat at which the iron is melted, but the heat at which the metal is poured that gives the strongest iron, and says, "Iron grows stronger as it stands in the ladle." I have failed in an attempt to reconcile the two statements.

The pouring of hot and dull test bars to obtain comparisons I tried over 14 years ago, and in New York City in November, 1884, I read a paper treating of this subject before the American Society of Mechanical Engineers. My first

trial, tested in a crude manner, showed a dull poured bar to be the strongest, but in subsequent experiments with 4-inch, 2-inch and 1-inch square bars planed on the four sides accurately to size, at the old Cuyahoga Works, Cleveland, in 1884, I found in breaking the hot and cold poured bars that the hot poured ones stood the greatest load. About this time Mr. Gardner, foreman of Pratt & Whitney's foundry, Hartford, Conn., also experimented in this line, and wrote me that he found the hottest poured bars to give the greatest strength. I would also state that at the time I experimented with the planed bars I also tried 1-inch square bars in the rough, and found with them the same results as with the above 4-inch, 2-inch and 1-inch test bars. Any one that may be interested in these experiments can find them fully detailed by referring to "American Foundry Practice," page 253, and "Moulders' Text Book," page 8.

Now, in view of these experiments I think I am entitled to say that Mr. Keep has not proved anything with his "mechanical analysis" or "sensitive test bars," as he calls them—a term I am at a loss to define, and I do think he would throw considerable light on the subject if he would point out definitely what he means by "sensitive test bars." I would like to ask what they are sensitive to. My experience and study in testing cast iron will not permit me to indorse "Keep's test for cast iron" as a standard most favorable to intelligent comparison in studying physical phenomena of cast iron in the various branches of practical every day founding.

For about eight years I have held the position that a round test bar, cast on end, is best adapted to making a comparison of the transverse strength or physical qualities of cast iron. I believe we could continue making tests with square bars "cast flat" (the smaller, below 1 inch square, the more unreliable) until the ores of all the earth were used up, and yet could not arrive at intelligent comparisons of physical phenomena of cast iron.

I see so much now depending on chemical and physical tests to give the founder positive knowledge as to the working of cast iron that I cannot but express the conviction that all the experience, intelligence and efforts of the Eastern and Western associations should be directed to the adoption of some standard system which, in their judgment, would prove best for testing the physical qualities of cast iron. And this should be done before any further statistics are tabulated on the physical phenomena of cast iron. How are we to make comparisons, or even say what is the transverse strength of cast iron, when we find test bars being used varying all the way from 4 feet down to 1 foot in length, and from 2 inches down to $\frac{1}{8}$ inch square in area; even granting a square bar to be the best form? If Mr. Keep will define "sensitive test bars," there are other points also which it would be well to have understood. I would ask him to explain the utility of his impact tests to the founder, and in what relation he has found them to bear to the transverse tests of like metal. I would also ask why he draws the line at transverse and impact tests and ignores tensile elements in cast iron. If we require impact, why should we ignore tensile strength as Mr. Keep does, and when we practically consider the question, are there not sufficient relations between transverse strength and deflection combined with contraction

and chill to permit of our judging of impact and tensile qualities as closely as we could when they are all compiled in one table, and then try to figure out their relative qualities? I mainly throw out this suggestion from the conviction that the more simple and less complex we can make a system of tests for cast iron, the less confusion will there be and the more speedily and accurately can the true natural qualities necessary to intelligent founding be attained.

I have studied the statistics of dead load, impacts, shrinkage and chill, on the compilation of which, for our consideration, Mr. Keep has expended much labor and research, in his Chicago paper of March 28. In subtracting the impact from the dead load column, one is struck with confusion in endeavoring to make deductions that could be practically applied to general every day founding.

Mr. Keep, in his paper before this association April 4, says: "The cold cupola at the beginning of a heat gives higher shrinkage every time." Then again, in another paragraph, says: "The increase in sulphur and the change in physical character was due to a cold furnace or cupola." Now, I claim that Mr. Keep's reasoning on this point is wrong, and would say that his higher shrinkage and increase in sulphur at the commencement of the heat is not due to a cold cupola, but is due to the harder grades or qualities of iron melting first, and if Mr. Keep will look to his own Series No. IV he will find that the combined carbon, sulphur and manganese stand highest in the first drawn metal.

To show my authority for the statement that hard or strong grades have a lower fusing point than soft grades, I would refer all to the following: "No. 1 iron has a higher melting point than No. 2."—Spretson, page 24. "The degree of fusibility depends on the amount of carbon which it contains."—"Strength of Material," page 31, John Anderson. "Fusing point of gray cast iron, 2192°; white cast iron, 1922° F."—Pouillet, in "The American Cyclopaedia," vol. VII, page 546. "Silicon melts at a point above iron, gray pig difficult of fusion, white iron readily fusible."—"Barker's College Chemistry," page 265. And Mr. Bloxham, in comparing gray and white iron, says: "The larger proportion of metallic iron contained in the gray cast iron causes it to require a higher degree of heat before it begins to exhibit signs of fusion, but it is capable of becoming very liquid at a sufficient high temperature so as to be easily run into molds." "White cast iron, on the other hand, is softened at a rather lower temperature, but does not flow well." It is generally conceded by experienced heavy machine jobbing founders that hard or strong cast iron melts the easiest, and if there are four or five grades of iron to be taken out of a cupola at one heat, the hard or strong iron (if it be desired to make a good sound clean casting) will generally be charged first in order to prevent it from melting and dropping down to contaminate soft iron, as would occur if the latter were the first charged. After a cupola gets well under way the softer qualities then come down to unite more uniformly with the harder elements of the iron; and thus, after the first one to twenty hundreds is melted (the quantity being largely dependent on the size of a cupola), we obtain a more uniform result from the mixture charged. And to still stronger sustain my claim that the harder elements in iron melt first, I would ask the question, Does

not an increase in contraction and chill imply an increase in the hardness of iron? I think experienced founders will agree with me in saying yes. Now I refer all to Mr. Keep's own tables, representing 11 heats, of tests taken at different stages of the heats, as shown in his Western paper. Here we find that every heat gives the highest contraction, and nearly all the deepest chill, at the first metal, which, as he claims, was poured after about 400 pounds had been taken from the cupola. Mr. Keep compiled this table, I am led to believe, solely for the purpose of trying to obtain some data to show, if possible, reason for obtaining stronger iron at the latter end of heats; and he says: "There is no uniform variation in strength, but there is in each case a decrease in shrinkage and chill." I have deduced reasonable conclusions from his contraction and chill tests, but have not attempted to do so from his records of transverse tests, as I claim that a square test bar, cast flat, is such an erratic thing that one cannot place any reliance in it. It is more liable to show weak iron to be strong, or the reverse, than it is to "hit" near the natural qualities of iron.

I respectfully here call attention to Mr. Keep's ill use of the term "shrinkage." The experience of the heavy work founder teaches him that there are two elements in iron cooling from a liquid state to that of a solidified body having a temperature of summer heat. In heavy work "risers," or "feeding heads," are necessary to make a solid casting. The metal in cooling down from a liquid to a solid state often requires feeding with additional fluid iron to prevent the casting being hollow or full of cavities. This is shrinkage. After metal has become solidified it commences to draw together. This is contraction and not shrinkage, as Mr. Keep calls it.

Mr. Keep's reasoning regarding the heat of a cupola is to the end that we should expect better and hotter iron after the fore part of a heat. This is news to me. My experience and observation in this line have been just the reverse. I never knew of an experienced heavy work founder, desirous of obtaining the hottest and cleanest iron for some special casting, who did not figure on taking it from the first charges of a heat, and would say that Mr. Keep's reasoning on this point is alone sufficient to lead one to error in trying to solve the problem under discussion of variation in strength of test bars at the beginning and end of heats. I admit that a cupola gets hotter if we limit our observations to the charging door or the heat going up the stack, but we should look to the melting point for effective results, not the charging door or stack. We cannot see the heat at the melting point. We can only judge of results by a process of reasoning. We know that at the fore part of a heat the fuel is comparatively fresh, clean and free of slag in the bed. The blast has then the freest chance to distribute its oxygen to the carbon of the fuel, as there is little slag or chilled iron at the tuyeres to prevent its proper delivery. I claim if a cupola is working properly we can obtain the hottest and cleanest iron at the fore part of a heat, and I believe the influences are to generally give the higher sulphur to iron at the middle and latter part of heats where a good system of fluxing and slagging out is not practiced, and that the effect of an increase in sulphur is to decrease silicon and promote combined carbon.

Whether this increases or diminishes the strength of iron depends, in my estimation, on the mixture of the metal used. If the mixture is for soft work or iron high in silicon, the sulphur could be the cause of decreasing silicon and increasing combined carbon to such an extent as to promote strength. And then again, if the mixture charged is for strong or low silicon iron, the tendency of the sulphur could be to decrease the strength, or a result just the reverse of the soft mixture. Do not confound the higher sulphur in the first drawn metal with that absorbed by iron in being remelted later on, as advanced in other parts of this paper.

I do not wish to be understood as recommending sulphur as a desirable element for strength. It has a limit to be guarded very carefully in seeking strength in sand castings, and is ruinous for chilled work, as ably outlined by President James Roberts in his annual address before the South Staffordshire Institute of Iron and Steel Works Managers, January 20, 1894.

Mr. Keep, in his paper, cites the sensitiveness and potency of his small test bars with a faith that should carry assurance, but nevertheless his test bar results have in no wise convinced me of the correctness of his conclusions. In the sixth paragraph from the end of his Western paper he says: "Instead of laying the blame on the sulphur in the fuel, it should be ascribed to lack of carbon in the fuel, which produces a cold cupola, which is likely to make just such iron as 788," seen in his Series IV. Mr. Keep seems to sustain the very point I make, which is that the cupola worked colder at the latter end of the heat, and not the fore part, as he claims. If there is any decrease of carbon in the fuel we should expect it at the latter end of a heat, as a cupola has then about run its course. I said nothing about sulphur in the fuel. What I claim is that the hotter you can melt iron with good slagging out, the more sulphur is liberated from it, or, in other words, the duller the iron comes down, the more sulphur it will absorb and retain.

The test 788 in Series IV, to which Mr. Keep refers us, only confirms that harder elements in iron melt easier than softer qualities. It is true that the transverse strength of the test bar 788 does not accord with the principle of receiving stronger test bars from the end of a heat; but as I claim elsewhere that a square test bar is too erratic to be reliable in giving the true natural strength of iron, my reasons for ignoring the "dead load" factor cannot but be apparent.

Mr. Keep asserts in his Philadelphia paper: "It is always customary to allow metal to become as cold as possible before pouring, so as to get the greatest strength." If this is always customary, I have never been around when it was practiced to obtain such results. I do know that when I have seen metal allowed to cool off, it was done to prevent run outs, scabs, blow ups and rough skinned castings, and to aid secure solid castings in massive work; but it is the first time I have been informed that it is always customary where strong castings are to be obtained (don't confound the term "strong" with "solid;" they mean two different elements in castings).

After considerable discussion, Mr. Keep recedes from his first position on chemistry being useless to founding, and in his paper of March 28 says he "could do nothing without it;" and then in his last paper returns again to his

old love and informs us that the contraction and fracture are sufficient for a guide, and he tells us how to mix a little of the new with lots of the old to obtain a knowledge of what the new will do. I will not say that an experienced founder could not often "hit" it in mixing iron without resorting to chemistry, but I will say that those that are in any position to utilize chemistry will find it a much more reliable agent than judging wholly by fracture of Keep's shrinkage and mechanical analysis system.

Mr. Keep, in his paper of April 4, 1894, under the paragraph "Keep's Foundry Chemistry," says: "For 20 years I was a close student of metallurgical chemistry, in charge of foundry work, and failed to find a relation between the chemical composition and the strength of test bars of various shapes." Then, in the next paragraph, he says: "When I hit on a $\frac{3}{4}$ -inch test bar for shrinkage I found a solution of the whole problem."

I am now preparing a paper, to be read at the coming meeting of the Western Association, 16th inst., in which I shall offer reasons why a round test bar cast on end should be adopted as a standard. In another paper I shall outline a system for molding and casting transverse bars, accompanied with a method for obtaining the contraction and chill, which I also claim are not being best attained at the present day. The three elements will make lengthy papers, hence my reasons for not bringing the subjects forward at this time.

The thanks of the meeting were then tendered to Mr. West by the president, for his interesting paper.

Secretary Evans expressed regret that Mr. West's paper had not been presented sooner, in order that it might have been printed and distributed to the members of the association.

Mr. West: I should like to suggest the taking up of the questions in the ratio and the answering of them as they are. Some of them could, no doubt, be answered direct, and the others might remain for another meeting. This would make matters tangible and bring out the ideas of the members.

Mr. Matlack: What is the size of the round bar?

Mr. West: I propose to make it 1 foot long. A short bar would conform to the machines in use at the present day.

Mr. Matlack: Have you considered the bar used by the Brown & Sharpe Mfg. Company? It is square, $1\frac{1}{4}$ inches at one end and $\frac{3}{4}$ inch at the other. When cast they get a bar 1 inch square very close to the center. Then they measure to the point that is 1 inch square, and put the bar under the testing machine. There is also another bar specified by water works engineers—1 x 2 inches, laid flat, 26 inches long, to take 24 inches between supports. These are for transverse tests.

Mr. West: I do not wish to commit myself this evening to the outline I mean to follow in the adoption of a round bar. The subject is a lengthy one, and when you read the paper you will find a good many scientific points involved. After the question is taken up and discussed it will be asked, "Why was it not taken up before?"

Mr. Outerbridge: I can indorse Mr. West's statement as the result of my own experience, having records going back to 1881, aggregating a large number. I have invariably found that when comparative test bars are poured into molds made from the same pattern and of exactly the same size the strength instead of increasing as the iron grows cool, as is stated by Mr. Keep, invari-

ably decreases, so that you can find a ratio of degrees of strength in direct relation to the increase of diameter. I was surprised at Mr. Keep's statement, and have received a number of letters from him in answer to letters I wrote him asking him for further information upon the subject. He reiterated his statement that iron grows stronger after it is taken out of the cupola and the longer it is held in the ladle. I find the opposite result, and therefore indorse Mr. West. The bars I have used have been 1-inch and $\frac{3}{4}$ -inch bars cast 15 inches long. The object of making them of that length is to allow of there being 12 inches between supports. It appears to me in reading Mr. Keep's paper that his pattern is shown in his diagrams as being 12 inches long. If he is correct the bar cannot be 12 inches long, and therefore the distance between supports must be less than 12 inches. I indorse Mr. West's statement that iron grows weaker as it grows cool, and the strong casting is made from the hot iron. That was exemplified in my experience in car wheel pouring, and more recently with a variety of castings of large size. I have always found that if you do not introduce any extraneous element the metal grows weaker as the temperature falls. Mr. Keep gives, I think, in a record numbered 788 a case of remarkably strong bar. That bar was a cold bar. What was done in that case? It was stirred with an iron rod. What happened? The moment you put a wrought iron or steel rod into cast iron you begin to melt a portion of it, and a small percentage of steel or wrought iron has a tendency to increase the strength. Twenty per cent. of white pig iron will produce about the same result as 5 per cent. of steel. Mr. Keep stirred that iron with an iron rod.

Mr. Matlack: I had a talk with Mr. Keep a week ago. It was not a steel bar he stirred the iron with, it was a pair of tongs.

Mr. Outerbridge: Of wrought iron. The same thing.

Mr. Matlack: I think you are mistaken about his claim that cold iron makes strength. He stirred the iron to give it a chance to get the bubbles out so that when he poured his bar he had less blow holes or tendency to blow holes. Another point in regard to his 12-inch bar. He has a peculiar holder on his machine which allows of the bar being taken in a clamp.

Mr. West: Regarding Mr. Keep not wishing to assert that iron did grow stronger, I do not see how he can go back on that statement. It is plain enough in his article. He says, "Iron grows stronger as it stands in the ladle. The bars of the last cast being colder, made a more solid casting with less internal stress. It is always customary to allow metal to become as cold as possible before pouring so as to get the greatest strength." I propose to hold Mr. Keep to every point he has made, to find out whether I am wrong or he.

Mr. Outerbridge: In one of Mr. Keep's tests he specifically states that the metal was not stirred, it simply remained in the ladle. The test 788 showed a phenomenal strength. I will not go into why I say phenomenal, but the record was, I think, 520 pounds for a $\frac{3}{4}$ -inch bar on a 12-inch piece, while the companion piece poured a few minutes before was perhaps 100 pounds less. There are experiments recorded where the iron was not stirred, but grew stronger simply by remaining for three minutes after the first piece was poured—nothing done to the iron whatever.

Mr. West: I should like to correct one idea. In speaking of the round bar being 1 foot long I meant at the points of support. The bar might be 18 inches, for that matter. It is from the support that we have to figure. And that is what I mean when I say a bar 12 inches long.

Mr. Flagg: Would the two bars Mr. Outerbridge mentions give a comparative test? Mr. Keep, in his earliest papers, calls attention to the fact that various sized test bars cannot be poured. There has been a great deal of time spent in an endeavor to answer that question. I was talking to Mr. Keep a short time ago about that very question of stirring. He said his tongs showed no burning whatever. He thinks it was the stirring, not the mixing in of the metal the tongs were composed of, which strengthened his bars.

Mr. Outerbridge: The companion bars were cast from the same pattern, with yokes at the end precisely as Mr. Keep uses them. The pieces were calipered, and where accurate work is required we plane the pieces down. I can give one instance which may be interesting. We cast a cube 15 inches long and 14 x 15 inches. We then cut it up into 54 parallel bars exactly 1 inch square, numbering every one, and locating bottom row, second, third, fourth and fifth rows, and so on. We broke every one of these 54 bars, and I have the record. It is quite interesting to see the difference in strength as well as the difference in grain from precisely the same casting, according to its position in that casting, and had I thought to bring two of these pieces here you would hardly believe they were cast in the same piece, certainly in a piece of that size. If you take the center piece and break it, it is exceedingly open grained. As you go toward the edge you get closer and closer grain, and as you go toward the center you decrease in strength.

Companion bars in all these cases were procured from the same pattern, from the same mold; made by the same man and poured at the same time.

Mr. Flagg: Could you reason, from the strength of your $\frac{3}{4}$ inch square bar, what the strength of your 1-inch square bar should be?

Mr. Outerbridge: That is the reason why I spoke of these records as phenomenal. A bar which will break at 500 pounds dead load on $\frac{3}{4}$ inch section, supports 12 inches apart, means a strength of 4000 pounds per square inch transverse on 1-inch bar with supports 12 inches apart. This is away up to the extreme high notch of gun iron melted in a wind furnace. What is the approximate tensile strength of such metal? We can estimate this from experience. There is a definite relation between transverse and tensile strength. It is not a uniform relation for all kinds of mixtures; ordinary foundry iron having tensile strength anywhere from 18,000 pounds to 20,000 pounds per square inch shows a ratio of about 8 : 1. That is, if an inch bar with supports 12 inches apart breaks transversely at 2500 pounds dead load, a tensile piece turned from the same specimen will pull about 20,000 pounds to the square inch. As you increase in strength of iron mixture this ratio rises in direct relation to the character of the iron, so that as you approximate a strength of 3000 pounds dead load on a bar 1-inch section with support 12 inches apart the ratio between the tensile and transverse records rises to 10 : 1 and over. Applying this law to Mr. Keep's records we can estimate the tensile strength of his strong $\frac{3}{4}$ inch

bar, which broke at 520 pounds, at 41,600 pounds per square inch. Such strength is, I believe, the extreme notch that can be found in any text book for the best cold blast charcoal iron melted under the most advantageous conditions and having very different chemical elements from the analysis furnished of Mr. Keep's strong bar in his last paper.

Mr. Flag: When you get a strong 1-inch square bar you get into close, hard iron. In a $\frac{3}{4}$ -inch bar you get something quite brittle. I know in malleable iron practice we get it very clearly marked. Take a small test piece 1 inch square it would show perfectly white, without a speck. Run it from 1 inch to 2 inches and there is a different result.

Mr. Outerbridge: Our experience, therefore, is not in favor of a $\frac{3}{4}$ -inch bar. It might be adapted to stove castings or thin plate, but it does not represent the texture of the iron in a large casting. Some time ago we cast an anvil block which took 60,000 pounds of iron to pour. The specification called for an extremely tough iron not hard or brittle. I have some chips from that casting which I will show you, and you can see its character. We recently had an interesting experience. I was asked whether it was usual in ordinary work to make a casting upon which a guarantee could be given that the companion test bars, poured with the casting, could pull 25,000 pounds to the square inch and that the metal in the casting would be of a nature easily machinable. As we had previously made some castings of gun lathes that went to Washington, I said yes; and on the strength of that a bid was made upon a large gear wheel weighing something over 1 ton. The specification called for metal to pull 25,000 pounds to the square inch, which must be ductile. Shortly afterward a letter came from a well-known consulting engineer stating that he made the specification for this wheel under the supposition that only persons prepared to pour gun metal in an air furnace were available; and that he felt constrained to place on record his incredulity as to the possibility of any kind of iron melted in a cupola pulling 25,000 pounds to the square inch, upon the test bar specified to go with this piece. The test bar was 15 inches long, a round piece, $\frac{3}{4}$ inch in diameter and turned to $\frac{1}{2}$ inch, I think. If the specification was filled he said he would be happy to accept the wheel. The wheel was in course of construction. The inspector came and said he had a letter from the consulting engineer, asking that we change the size of the test bar. They had all been molded and from the designated pattern. A new pattern was made in accordance with the modification asked, $1\frac{1}{2}$ inches diameter, 15 inches long, to be turned down to 1 inch diameter for a distance of 10 inches between shoulders. The object of this change was to turn off the entire skin of the metal as well as to cast a bar with a larger section, and thus avoid the possibility of gain in strength due to the skin of the metal on the smaller section and the closer grain found in such section. The $1\frac{1}{2}$ -inch section gave a closer relation to the section of the metal in the tooth of the wheel. That was done. We made eight test bars, in various forms. We took one at random and turned it up for a test of our own, and at the moment we were to pull the inspector happened to come in and he was invited to be present. The apparatus began to pull, and there was

some little interest as the indicator began to run up. The piece showed tensile strength of 30,300 pounds to the square inch. That wheel was accepted and finished and machined as readily as any pulley, and the fracture of the test bar was perfectly solid. I do not imagine that a $\frac{3}{4}$ -inch test bar with that metal would have been satisfactory.

President Schumann: That iron was melted in a cupola?

Mr. Outerbridge: Yes, and it was melted in a cupola from which in less than half an hour before that metal was due to arrive at the spout pulleys of the smallest size were poured. And that is being done every day. It is the ability to control the character of the metal delivered at the spout which constitutes the main difference between modern scientific methods of foundry practice and older rule of thumb methods.

Mr. Flag: Regarding the peculiar fitness of a $\frac{3}{4}$ -inch square bar for stove work, I am struck with the idea Mr. Mumford has, and with a good deal of success, on that same test bar. At the Worthington Works they make light work, but Mr. Mumford says a good deal for it in all work.

Mr. Outerbridge: The relation is about 8 to 1. If the $\frac{3}{4}$ -inch bar breaks at 300 pounds to the square inch we expect the 1-inch to break at 2400 pounds. The relation is the same with the same iron. The iron I was speaking of was of a different character, and was not adapted to the $\frac{3}{4}$ -inch bar at all. The only thing is that the $\frac{3}{4}$ -inch bar is subject to the cooling influence of the sand mold and gives a closer grained metal, and is naturally a little stronger per square inch for that reason than the 1-inch piece. And it was for this reason that the engineer instructed that we increase the size, that he might avoid getting an abnormal strength in the test piece.

President Schumann: It is not, then, even the primary physical law that strength increases with the density, and that in the same iron made from the same pig the hotter you pour the iron the greater the density.

Mr. Outerbridge: I showed this in the bars cut from the cube.

W. C. Henderson then read a paper by John E. Fry of Pittsburgh, on

Foundry Chemistry.

In relation to the question of foundry chemistry, Mr. Keep, in his last paper read before you, refers to statements made by the writer that were not in harmony with his views, and presents figures of many tests to support his position, and especially to call attention to the value of his practical methods and machines for determining the physical qualities of cast irons of all foundry grades. The writer has urged the importance of the chemist in investigation to supplement the work of the physicist—that the two must work together; that the work of either would be worthless without that of the other. Mr. Keep refers the whole subject to the physicist, and having formulated a method that is satisfactory to himself in his branch of the foundry business, recommends it in all. Let us consider its fitness from the view point of the exhaustive line of tests he presents, and in the light of such facts in relation to the fitness of irons of certain chemical composition as are established beyond controversy.

A very few of the many figures Mr. Keep gives will suffice to both approve and condemn his test bar, according to the uses for which the iron under in-

vestigation may be desired. He calls his test a relative one, but how it relates he does not explain, nor how an equation is to be written to refer the physical results of his finding to castings of varying sections. After scolding the chemists—in a previous communication—for giving too much attention to the “fourth place of decimals,” he presents to you a test bar having but one fourth of 1 square inch of section and weighing about 0.7885 pound avoirdupois. In his “Keep's Test for Cast Iron” he strongly insists upon adhering “absolutely” to a specified routine in its preparation, even to the use of a specific grade of sand and a “carefully impressed” workman to mold it.

He requires four bars to be made so that the average of the four and not the vagaries of one may be called the conclusive result. Thus a large personal factor enters into the preparation of these bars, and the contradictory results he shows are the measure of it.

His method of applying lateral stress instead of the customary extension pull to determine cohesive strength is unique in modern practice, and seems to be a refinement of the old time method of breaking a pig of iron by a “side swipe” with a sledge, which modern physicists have abandoned. Mr. Keep prefers to use and recommend “Keep's impact testing machine” and “Keep's dead load testing machine,” and it is from tests made on these he obtains the contradictions he lays before you as data to guide you in the selection of pig iron for foundry use in making all classes of work. If the test bar is untrustworthy the figures also will be. As Mr. Keep has not worked out for us the equation that would indicate the probable physical character of any casting differing from the $\frac{3}{4}$ inch square bar, we are confined to consideration of the fitness of certain irons for making these test bars alone, for the relation between this bar and, say, a sash weight is a fine field for fancy that is too wide for fact.

In his discussion Mr. Keep refers to one particular test, which is his No. 782 of his Series IV, and in his Series VIII he gives 780, 781, 782 and 783 as being cast from the same ladle of iron at stated intervals of time. No. 782 is presented as having excellent qualities in the test bar. The analysis of this iron, ignoring insignificant decimal parts, is as follows: Total carbon, 3 per cent.; silicon, 3.50 per cent.; phosphorus, 1 per cent.; manganese, 0.50 per cent.; sulphur, 0.08 per cent.

Is needs no argument to convince you that iron of this composition would be totally unfit to use by itself in any machinery casting requiring strength. We have only to take the “Keep's test” figures to prove it unfit for $\frac{3}{4}$ -inch bars that required strength.

Its fitness as a stove plate iron is not in question, although Keep's test does not prove it to be trustworthy for even that use. We need not go beyond this single hand ladleful of iron to cause us to be “shy” of this erratic little test bar. I quote Mr. Keep's description of his manipulation of the iron for Series VIII, containing the special bar No. 752. He says: “No one would claim any difference in chemical constitution. In Series VII I give four average tests to show the influence of time and cooling after iron is caught in a ladle. Time allows particles of slag and gas to escape, and cooling causes a more compact grain.”

The two sets of tests in Series VIII are exactly alike, but made some days

apart. The ladle held 28 pounds of iron, and on reaching the molder's floor a steel bar with the end about 1 inch in diameter was introduced 2 inches below the surface, and with it the surface was stirred slowly for one-half minute. It took one-quarter minute to pour the three flasks of test bars. The surface was then stirred as before, and so on. The metal was so cold that before the fourth pouring the surface was stirred very little. The metal was cooled more than in Series VII, and the agitation no doubt helped to remove slag and gas."

The element of time here enters the equation, and the reasons given by Mr. Keep for the physical changes in the several bars indicate that the escape of gases and slag should also be taken into account. This is a side track to be avoided if we expect ever to arrive at fact. The fourth place of decimals would not carry us far enough to ascertain the physical influence of the escape of occluded gases from pig iron so chock full of occluding agents as the iron in question is.

If the relative strength of No. 782 be taken at 100, then the test bar poured from the same ladle three-quarters of a minute before would be 96, and the one cast one and one-half minutes earlier would be 82. Applying these figures to a standard bar of 1 inch square, the strength of the first one cast being taken at 20,000 pounds, that of the others would be 23,350 and 24,300 pounds per square inch respectively. Were we to compare the figures given in Series IV of this test bar series, the difference between the first and last bar would be as 20,000 pounds to 23,560 per square inch, and this difference is greater than could occur in proper bars from the same ladle of iron. The differing figures given for the No. 782 bar in Series IV and VIII presented by Mr. Keep may be a typographical error, but criticism applies equally to both.

Mr. Keep adds, "There is practically no variation in shrinkage and chill and no variation in chemical composition, and yet there is a very great change in strength, which is due to two causes, the clearing of the metal from slag and gas on account of time, and the lessening of internal stress, because the first bars poured formed a rigid shell around very hot metal. In cooling and crystallizing each grain tended to pull away from those next to it. The bars of the last cast being colder, made a more solid casting with less internal stress."

Is not this difference in the strength of the iron the intrusion of the personal factor? Certainly a chemical change of the iron is occurring constantly when liquid, but in a ladle would be insignificant for the period of time noted, or for any period iron could be held in small ladles in foundry practice. But Mr. Keep can only account for it by claiming both chemical and physical changes have occurred in the one and one-half minutes' time between the pourings.

How about his slags and gases? It is quite impossible for any slags and gases to be liberated from his ladle of iron for the third bar that were there up to the moment of pouring the first one, for its slag would have floated out and the gases of occlusion be stably held; therefore any that could separate out in the one and one-half minutes must have been formed in that short time. What are they? Admitting the presence of dissolved protoxide of iron in the metal in contact with much silicon and some manganese, it is possible that this FeO would unite with the

metalloids to form a slag—the familiar basic silicate of iron and manganese; but as only a solid is formed, no gases resulting from the reaction can exist to escape, and the only gas that could come off as the result of such reaction would be the increment of the total gas of occlusion, which had been held by the components of the slag that formed, and this trifle of gas would remain stably held by the metal from the presence of the large quantity of occluders it contains; but the insignificance of the time allowed for these reactions places the extent of them out of sight below the fourth place of decimals, which Mr. Keep deplures in discussion. No appreciable amount of slag could form. No gas could escape. Why still hunt through the province of the steel chemist for the cause of a physical phenomenon? The trouble is with the dimensions of the test bar.

When Mr. Keep says, "Carbon in melted iron is always combined," he only imperfectly quotes the undersigned, and without the courtesy of credit, who has stated in a previous letter to you that "in liquid iron the total carbon is in the so-called combined state." In question as to whether carbon is chemically combined (alloyed) with liquid iron, or only molecularly diffused to again regroup its molecules into visible masses of graphitic carbon when slowly cooled, we shall be in good company in holding to either view, as it is a matter of choice with authorities relative to their experience, and it need not be mentioned here were it not probable that it furnishes the key to the relative grayness, and consequently the physical structure, of iron to the time of its solidification from liquidity. We need not be told that a given iron is less gray or less open in structure as it is more quickly cooled, nor that white iron results from instantaneous cooling of cast iron that would be open grained if cooled sufficiently slow. If the two different test bars were cast under the same condition as to the molds they would only differ in grain as the loss of heat between the pourings would affect their solidification. Would the loss of heat in the minute and a half account for the difference in strength as given? If this could be, would this law be constant and additional cooling of the liquid iron add strength proportionately? If so, what would be the strength of the fourth bar of the series had Mr. Keep favored us with its possibly contradictory testimony? As we cannot attribute the inconstancy of the bars to the fact that they were chemically similar we must then suspect the accuracy of "Keep's dead load testing machine" or look further for the cause of the difference in strength, for on the basis of this difference alone in the presence of chemical uniformity Mr. Keep discards as irrelevant the chemical composition of iron in its relation to physical properties. We may find a solution of the question in the physical differences of the bars, and account for it without difficulty.

Were the bars cast under the same mold conditions? Was one mold a trifle more dry than the other despite the care of the "carefully impressed" workman? The more dry the mold, the better conductor of heat it becomes. In ordinary machinery work the difference in the dryness of two green sand molds would signify nothing in effect on the iron, but in case of these little bars it is different.

The mold for the Keep bar presents 8 square inches of sand surface to each

cubic inch of iron; or, by weight, there are 80 square inches of sand surface to 1 pound of the iron. It is plain then that the relative heat conducting power of these molds becomes an important factor, as a very trifle of dryness of one would strongly affect the time of solidification, and the more quickly cooled bar would be closer grained from its more completely diffused carbon. This physical condition would increase cohesion, and Mr. Keep will find more satisfaction in attributing the difference in the so-called strength of the bars to this cause, than in trying to account for the difference in the two from any infinitesimal disengagement of slag and gases that might be possible under the short time conditioned.

Only castings of $\frac{1}{4}$ inch in thickness and under are subject to the mold conditions of these little test bars. So much depends on the time of cooling to solidity that it is reasonable to suppose that the iron in consideration would be suited only for such thin work. If Mr. Keep will cast two bars at the same instant from the same ladle of iron, one in a green and the other in a dry sand mold, he will find them different in physical properties to a degree away beyond need of chemical interpretation, but these effects produced by difference in time of cooling threads of cast iron need not confound us regarding true effects from chemical difference in the irons. These little shop tricks are entirely extraneous to the subject in discussion, but they must have full consideration when introduced to sustain a line of argument which would fail in their absence.

What application of this test bar can be made in irons for heavier work than $\frac{1}{4}$ inch thick and under? How does it "relate" to such? Is not this little bar a true "fourth place of decimals" relative to an ordinary machinery casting? Would you trust it? Let us consider your practice in this respect. You send patterns of castings requiring strength to the one foundry in your city which has reverberatory or "air" furnaces. The physicist at this shop casts a test bar having more than 40 times the section of Mr. Keep's. Chemistry determines the general character of the metal charge of the furnace, and the physicist "tempers" the melted charge to compensate for chemical changes occurring during the several hours of treatment in the furnace. You all know you get a stronger casting there than by guess work in your own metal yards, and, up to date, most of you do not care for the "why." Will the owner of this foundry tell you he cannot closely approximate a physical result from the chemical analysis of his irons? Will he not contract to deliver castings having definite and very high tensile strength? Surely; but it would be as definite to judge the strength of a 36 inch mill roll from the iron which ran into a vent hole as to guess at the relation between Mr. Keep's little bar and any of the castings made for you.

Mr. Keep tells us that "the eye, guided by common sense, will tell what grain is necessary to make castings fit for (almost) any purpose;" but the physicist of the foundry above referred to depends rather on his information as to the chemical composition of his irons than on the 50 years of practical experience he supplements it with.

Mr. Keep is deeply indebted to the chemist, without whom he could do nothing, as he admits. He acknowledges thankfully the "gratuitous work" they have done for him.

His hypotheses as to the effects of the several metalloids could not be formed without having access to exhaustive chemical research, but the character of his views regarding these effects is questionable as long as he leans so heavily on this little bar, which brings in so many conditions that do not obtain in machinery casting. We have much yet to learn concerning the effects of the metalloids in cast iron, and can learn little in controversy, but much by co-operation of the chemist and physicist, and in no other way. Chemical analysis fits all classes of castings, while test bars, to be trustworthy, must be of a size to give approximately constant results when cast under ordinary conditions.

This Mr. Keep's bar will not do, and his machines will not take bars which will. In the selection of a testing machine suited to foundry work one need not go out of your city to find the best makes in the world, and a single well appointed chemical and physical laboratory in your city would soon place at your disposal all that is now known on the subject in question, and enable you to eradicate from your business the perplexities which dog the footsteps of the purely practical foundryman.

It was one of the purely practical sort who exclaimed, more in vexation than anger:

Ay, me! what perils do environ
The man that meddles with cold iron.
What plaguy mischiefs and mishaps
Do dog him still with after claps.

Mr. West: The fact of their taking into consideration the figuring out of the area of the sand which is affected by the heat is a very good point and well taken; and even if we improve on a square bar, the matter of having a small bar is very detrimental to our obtaining any comparison. The factor of his bar being so small, I think I see the reason why he obtained the stronger bars from his dull iron.

A paper by Prof. J. B. Johnson of Washington University, St. Louis, on "The Strength and Resilience of Structural Cast Iron" was, on motion, referred to the next meeting of the association.

The Price Committee then reported by sections.

Cast Iron Pipe.—P. D. Wanner for this section reported that prices were still extremely low, but appeared to be more steady. His foundry, he said, had started running again after the longest shut down experienced in 15 years.

Sash Weights.—For this section E. E. Brown reported that there was no change in prices. The foundries were all running on short time and there was considerable stock on hand. Orders coming in were few and prices were exceedingly low.

Small Gray and Malleable Iron Castings.—Stanley G. Flagg, Jr., for this section reported that there was no change. He had just returned from a trip to Detroit, Cleveland and other cities, but did not see any foundry working more than three-quarter time, and the majority were not running so much.

The meeting then adjourned.

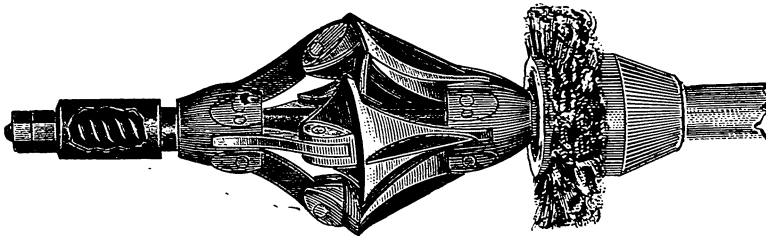
Among those present were the following:

T. J. Rankin and J. E. Bradley of the Abram Cox Stove Company, Philadelphia. W. R. Webster, Pottstown Iron Company, Pottstown, Pa. E. K. Landis, Philadelphia Testing Laboratory, Philadelphia. T. A. Daly, *Iron Trade Review*, Cleveland, Ohio. W. H. Pepper, *The Iron Age*; D. J. Matlack, Wm. Cramp Ship Building &

Engine Company; W. H. Wark, Dienelt & Eisenhardt, Philadelphia. W. E. Kelley, New Brunswick, N. S. R. J. Matlack and F. A. Riehle, Riehle Testing Machine Company, Philadelphia. P. D. Wanner, Mellert Foundry & Machine Company, Reading, Pa. J. S. Stirling, Harlan & Hollingsworth Company; G. A. Messick, Pusey & Jones Company, Wilmington, Del. A. W. Howe, Philadelphia. Wm. Russell, Phoenix Iron Works, Cleveland, Ohio. J. W. Moore, Crane Iron Company; W. C. Henderson and Thomas Devlin, Thomas Devlin & Co.; E. E. Brown, E. E. Brown & Co.; Thomas Hobson, *The Iron Age*, Philadelphia. T. B. Harkins, T. B. Harkins Foundry Company, Bristol, Pa. A. W. Outerbridge, Wm. Sellers & Co.; Chas. James, Henry Disston & Sons; Josiah Thompson, J. Thompson & Co., Francis Schumann, Tacony Iron & Metal Company; James Blankley, Blankley Bros. Company, Philadelphia. L. S. Wright, Camden Iron Works, Camden, N. J. S. G. Flagg, Jr., S. G. Flagg & Co.; Walter Wood, R. D. Wood & Co., Philadelphia. Thomas Glover, Glover Bros., Frankford, Pa. Chas. L. Prince, Camden Iron Works, Camden, N. J. W. F. Sauter, G. Rebmann & Co., Philadelphia. W. H. Green, Vulcan Works, Chester, Pa. W. H. Pfahler, Abram Cox Stove Company, Philadelphia.

The Anderson Boiler Tube Cleaner.

G. P. Anderson of 39 Oliver street, Boston, is the maker of the combined scraper and fine wire brush for cleaning



THE ANDERSON BOILER TUBE CLEANER.

boiler tubes here illustrated. It is so constructed that the scraper enters the tube first and does the hardest part of the work, while the brush follows and sweeps out the tube much cleaner than it is possible to scrape it. The combination is so put together that the brush can be easily renewed when necessary.

The Corrosion of Pipes by Electrolytic Action.

A very valuable paper has been presented by J. H. Farnham before the American Institute of Electrical Engineers on the corrosion of water and gas pipes through the electrical currents of trolley lines. He summarizes his conclusion as follows:

1. All single trolley railways employing the rails as a portion of the circuit cause electrolytic action and consequent corrosion of pipes in their immediate vicinity, unless special provision is made to prevent it.

2. A fraction of a volt difference of potential between pipes and the damp earth surrounding them is sufficient to induce the action.

3. Bonding of rails or providing a metallic return conductor equal in sectional area and conductivity to the out-

going wires is insufficient to wholly prevent damage to pipes.

4. Insulating pipes sufficiently to prevent the trouble is impracticable.

5. Breaking the metallic continuity of pipes at sufficiently frequent intervals is impracticable.

6. It is advisable to connect the positive pole of the dynamo to the trolley lines.

7. A large conductor extending from the grounded side of the dynamo entirely through the danger territory, and connected at every few hundred feet to such pipes as are in danger, will usually insure their protection.

8. It is better to use a separate conductor for each set of pipes to be protected.

9. Connection only at the power station to water or gas pipes will not insure their safety.

10. Connection between the pipes and rail or rail return wires outside the danger district should be carefully avoided.

11. Frequent voltage measurements between pipes and earth should be obtained, and such changes in return conductors made as the measurements indicate.

As illustrating the general character of the lawless mobs of strikers which have engaged in rioting and bloodshed lately, a Cleveland paper says that there was not a native American, a German, or an Irishman among the rioters that attacked the Variety Iron Works, in that city, the other day. There was scarcely a man among them who could

speak English. They were aliens in their speech, in their methods, and in their understanding of the laws of this country. They represented anarchy, and they furnish a good illustration of the need for more stringent observance of our immigration laws and also for some improvement in these laws which shall discriminate as to what kind of immigrants will be acceptable and what kind will not.

Manufactured coke was tried recently as a smokeless fuel on board the steam yacht "Comet" at Baltimore. The vessel made an experimental run under steam generated by this fuel, the experiment proving most successful. The run was made as far as Fort Carroll and demonstrated, it is claimed, that coke when properly prepared is a perfectly smokeless fuel and of extraordinary steam producing power. The naval authorities at Washington are inquiring into the matter and special experiments are likely to be undertaken as to the value of coke for use in war vessels.

Charles G. Eckstein & Co. have removed their offices to 45 Vesey street, New York.

Fuel Gas at Pittsburgh.

The announcement that the Philadelphia Company, the largest suppliers of natural gas in the Pittsburgh district, propose to engage in the manufacture of fuel gas at no distant date is of considerable interest. While plans for the new project have not been fully developed, it is the present intention to commence operations in a modest way and to pay the preliminary expenditures out of the surplus earnings of the Philadelphia Company. In this connection it is of interest to note that some five or six years ago the manufacture of fuel gas from water and oil was undertaken in Pittsburgh by an identified interest of the Philadelphia Company. A small plant was put up, and after experiments had been carried on for some months the success anticipated was not realized and the project was dropped. While natural gas for domestic and light manufacturing purposes is still found in goodly quantities in the gas producing fields lying adjacent to Pittsburgh, it is only a matter of time until the supply will be exhausted. The steady decrease in production during the last few years is proof of this, and while it is true that new fields have been discovered and opened up the supply is gradually but surely diminishing. The use of natural gas for domestic purposes has been largely discarded within the past few years on account of its increased cost, the average charge to private consumers being 22½ cents per 1000 feet, as against 10 cents and less when the first discoveries of natural gas in Allegheny County were made. To Pittsburgh belongs the credit of finding and putting to practical use the most magnificent fuel that ever was used, and it is but natural that the outside world looks to that city to supply a substitute, now that the original fuel is failing in supply so rapidly. While, as stated above, the plans for the manufacture of fuel gas are not perfected by any means, it is confidently hoped by those interested in the matter to furnish the new fuel at a cost very little in excess of the present charges for natural gas. The final outcome of the experiments shortly to be made will be awaited with much interest.

Electricity in a Large Factory.

The Western Electric Company are equipping their extensive factory in Chicago with separate electric motors to operate the different departments. They will thus avoid large belts, large hangers and long shafting. In order to operate a system of this kind economically the power plant is divided into units equivalent to the requirements of the factory. Thus, when it is only necessary to operate light loads an engine and dynamo of suitable size can be arranged to carry, practically, a full load, at which point the efficiency of the plant is at its maximum. When additional power is required, another engine and generator can be started and run in multiple with the first generator. By thus adjusting the units, the machines can be operated at all times at full load, and a great saving in fuel made over the common custom of operating a large power plant at half or three-quarter load. The generating station in the Western Electric Company's factory consists of two large Western electric generators, which are belt connected to a medium high speed Russell engine. This plant is used to furnish power during the day and is run with a

constant load at all times upon the machines. When it is desired to operate the plant at night, a small generator of 50 horse-power capacity is driven from a 60 horse-power Russell engine.

In the machine shop the power is divided up into units to fit necessities. One 35 horse-power motor is used to run the shaft, extending the entire length of the shop, from which power is taken to run all the small machines. Three independent motors of 5 horse-power capacity each are used to drive the large machines, such as the boring mill, milling machine and planer. These motors are all placed on a platform over the belts, thus keeping them away from any pieces of iron which may be flying through the air, and not occupying floor space which is valuable for other purposes. On the other side of the machine shop is a 10 horse-power motor, which is used to run short lengths of shafting driving small ma-

size from 2 horse-power to 40 horse-power. The entire system of line and counter shafting which was originally installed is being gradually suspended by electrical transmission.

The Johnson Self Feeding Boiler Tube Expander.

The construction of the Johnson boiler tube expander will be understood by reference to the accompanying cuts, which show it in perspective and section. There are five small rollers, each of which revolves when the center pin is turned, and the tool itself has a rotary motion which produces a uniform pressure, insuring the perfect expansion of the tube. The small rollers being started at an angle, the turning of the center pin feeds the expander into the tube without driving; it is released by turning in the opposite direction. It will be

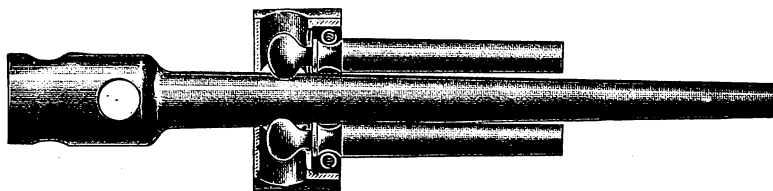


Fig. 1.—Sectional Elevation.

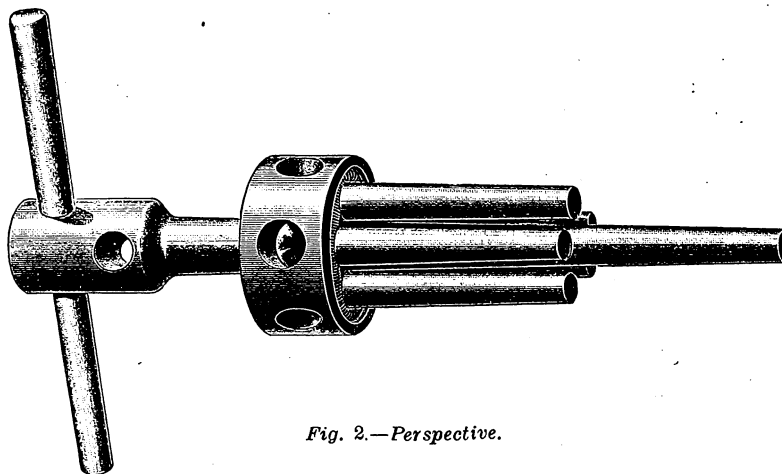


Fig. 2.—Perspective.

THE JOHNSON SELF FEEDING BOILER TUBE EXPANDER.

chinery used for special purposes. A 5 horse-power motor is also used for operating the elevator, which carries material from the main floor to the gallery floor. Another 5 horse-power motor is used for running the metal saw machine.

A 10-ton electric crane, manufactured by the Yale & Towne Mfg. Company, Stamford, Conn., is operated in this room. The entire electrical equipment of this crane was manufactured by the Western Electric Company, and consists of a 5 horse-power traveling motor, a 2 horse-power traversing motor and a 10 horse-power hoisting motor. These motors are all of the multi-bipolar type, slow speed, and direct connected by means of worms and gears to the crane. The starting, stopping and reversing gear for these motors is unique. By one throw of the lever resistance is inserted into the armature circuit and the main switch is closed. Throwing the lever in the opposite direction reverses the motor. The Western Electric Company at the present time have in operation 14 motors, aggregating 257 horse-power, varying in

noticed that in this expander—which is made by the Henry C. Ayer & Gleason Company of 919 Betz Building, Philadelphia—there are no screws, casings or rollers on pivots.

The work of adding 14 feet to the new gunboats "Machias" and "Castine" will be begun this month at the Brooklyn Navy Yard. This operation will give employment to a large force of men during the summer.

A curious incident, illustrating the relations between employers and employed, recently occurred in the glass works of Croismare, in the north-western part of France. The work people struck and the works were closed down. The proprietor, Madame Bailly, put the factory at auction, and it was bought for 116,000 francs by the workmen, who raised a total fund of 200,000 francs for the purchase money and the first expenses in starting work. Four hundred shares were subscribed in two weeks' time and the strike was at an end.

The Latest Senate Bill.

The latest proposal of the majority in the Senate radically changes the rates on metals proposed in the Wilson and Senate Finance Committee bills. The principal features of the proposed measure are as follows:

Pig iron, \$4 per ton; present, \$6.72; Wilson, 20 per cent.; Senate, 22½ per cent. The Senate bill excluded ferromanganese from this section, making it 10 per cent. The others included it in the pig iron paragraph.

Beams, angles, columns, &c., 6 cents per pound; present, 9 cents; Wilson, 30 per cent.; Senate, 35 per cent.

The boiler plate paragraph reads as follows in the present law. We have bracketed the latest changes. the Wilson bill taking the general rate of 25 per cent. and the Senate Finance Committee 30 per cent.:

Boiler or other plate iron or steel, except saw plates hereinafter provided for, not thinner than No. 10 wire gauge, sheared or unsheared, and skelp iron or steel sheared or rolled in grooves, valued at 1 cent per pound or less, $\frac{1}{10}$ cent per pound; valued above 1 cent and not above $1\frac{4}{10}$ (1.5 cents) cents per pound, $\frac{1}{10}$ cent (0.6 cent) per pound; valued above $1\frac{4}{10}$ (1.5 cents) cents and not above 2 (4 cents) cents per pound, $\frac{3}{10}$ cent per pound; valued above 2 cents and not above 3 cents per pound, $1\frac{1}{10}$ cents per pound (30 per cent.); valued above 3 cents and not above 4 cents per pound, $1\frac{5}{10}$ cents per pound; valued above 4 cents and not above 7 cents per pound, 2 cents per pound; valued above 7 cents and not above 10 cents per pound, $2\frac{8}{10}$ cents per pound; valued above 10 cents and not above 13 cents per pound, $3\frac{1}{2}$ cents per pound; valued above 13 cents per pound, 45 per centum ad valorem (all valued above 4 cents, 25 per cent. ad valorem): Provided, That all plate iron or steel thinner than No. 10 wire gauge shall pay duty as iron or steel sheets.

On forgings the present law reads, the proposed rates bracketed: Forgings of iron or steel, or forged iron and steel combined, of whatever shape, or in whatever stage of manufacture, not specially provided for in this act, $2\frac{3}{10}$ cents (1.5 cents) per pound: Provided, That no forgings of iron or steel, or forgings of iron and steel combined, by whatever process made, shall pay a less rate of duty than 45 (35 per cent.) per centum ad valorem. Wilson, 25 per cent.; Senate, 30 per cent.

Steel rails, $\frac{7}{10}$ cent per pound, \$7.84. Present rate, \$13.44. Wilson, 20 per cent.; Senate, 22½ per cent.

The sheet iron clause, which in the present law reads as follows, has been changed as bracketed: Sheets of iron or steel, common or black, including all iron or steel commercially known as common or black taggers iron or steel, and skelp iron or steel, valued at 3 cents per pound or less: Thinner than No. 10 and not thinner than No. 20 wire gauge, 1 cent per pound (0.7 cent); thinner than No. 20 wire gauge and not thinner than No. 25 wire gauge, $1\frac{1}{10}$ cents (0.8 cent) per pound; thinner than No. 25 wire gauge, $1\frac{4}{10}$ cents (1.1 cents) per pound; corrugated or crimped, $1\frac{1}{10}$ (1.1 cents) per pound: Provided, That all common or black sheet iron or sheet steel not thinner than No. 10 wire gauge shall pay duty as plate iron or plate steel.

The words "35 per cent. ad valorem" at the conclusion of paragraph 119 in

the Wilson bill, which reads as follows: "All iron or steel sheets or plates, and all hoop, band or scroll iron or steel, excepting what are known commercially as tin plates, terne plates and taggers tin, and hereinafter provided for, when galvanized or coated with zinc or spelter, or other metals, or any alloy of those metals," are stricken out and the following inserted in lieu thereof: "Shall pay $\frac{1}{2}$ cent per pound more duty than the rates imposed by the preceding paragraph upon the corresponding gauges or forms of common or black sheet or taggers iron or steel."

Paragraph 120 of the Wilson bill: "Sheet iron or sheet steel, polished, planished or glanced, by whatever name designated, 35 per cent.," has had the rate stricken out and $1\frac{1}{2}$ cents per pound substituted, and the following proviso added: "That plate or sheet or taggers iron or steel, by whatever name designated, other than the polished, planished, or glanced herein provided for, which has been pickled or cleaned with acid, or by any other material or process, or which is cold rolled, smoothed only, not polished, shall pay $\frac{1}{2}$ cent per pound more duty than the corresponding gauges of common or black sheet or taggers iron or steel."

On ingots, &c., on which the Wilson and the Senate bills have a 35 per cent. rate, the reading of the present law has been again accepted, with the bracketed changes in the rates:

Steel ingots, cogged ingots, blooms and slabs, by whatever process made; die blocks or blanks; billets and bars and tapered or beveled bars; steamer, crank and other shafts; shafting, wrist or crank pins, connecting rods and piston rods, pressed, sheared or stamped shapes; saw plates, wholly or partially manufactured; hammer molds or swaged steel, gun barrel molds not in bars, alloys used as substitutes for steel tools; all descriptions and shapes of dry sand, loam or iron molded steel castings; sheets and plates not specially provided for in this act, and steel in all forms and shapes not specially provided for in this act; all of the above valued at 1 cent per pound or less, $\frac{1}{10}$ cent (0.3 cent) per pound; valued above 1 cent and not above $1\frac{1}{10}$ cents per pound, $\frac{1}{10}$ cent (0.4 cent) per pound; valued above $1\frac{1}{10}$ cents and not above $1\frac{5}{10}$ cents per pound, $\frac{1}{10}$ cent (0.6 cent) per pound; valued above $1\frac{5}{10}$ cents and not above $2\frac{1}{10}$ cents per pound, $\frac{1}{10}$ cent (0.7 cent) per pound; valued above $2\frac{1}{10}$ cents and not above 3 cents per pound, $1\frac{1}{10}$ cents (0.9 cent) per pound; valued above 3 cents and not above 4 cents per pound, $1\frac{5}{10}$ cents (1.2 cents) per pound; valued above 4 cents and not above 7 cents per pound, 2 cents (1.3 cents) per pound; valued above 7 cents and not above 10 cents per pound, $2\frac{8}{10}$ cents (1.9 cents) per pound; valued above 10 cents and not above 13 cents per pound, $3\frac{1}{2}$ cents (2.4 cents) per pound; valued above 13 cents and not above 16 cents per pound, $4\frac{7}{10}$ cents (2.8 cents) per pound; valued above 16 cents per pound, 7 cents (4.7 cents) per pound.

The wire rod clause, which takes a 25 per cent. rate in both the Wilson and the Senate bills, returns to the specific rate, the present law being as follows, with the proposed rates bracketed:

Wire rods: Rivet, screw, fence and other iron or steel wire rods and nail rods, whether round, oval, flat, square, or in any other shape, in coils or otherwise, not smaller than No. 6 wire gauge, valued at $3\frac{1}{2}$ (4 cents) cents or less per pound, $\frac{1}{10}$ (0.4 cent) cent per pound (valued at over 4 cents per pound,

0.75 cent per pound); and iron or steel, flat, with longitudinal ribs, for the manufacture of fencing, valued at 3 cents or less per pound, $\frac{1}{10}$ cent per pound (omitted): Provided, That all iron or steel rods, whether rolled or drawn through dies, smaller than No. 6 wire gauge, shall be classed and dutiable as wire.

The tin plate paragraph of the Wilson bill, which reads, "Sheets or plates of iron or steel, or taggers iron, or steel coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates and taggers tin," has been increased from 1 cent in the Senate Finance Committee bill to $1\frac{1}{2}$ cents per pound, as in Wilson bill. The present rate is 2.2 cents.

The paragraph relating to wire reads as follows:

"Wire, round iron or steel wire, all sizes up to 13 wire gauge, $1\frac{1}{2}$ cents per pound; finer than 13 wire gauge, up to 16 wire gauge, $1\frac{1}{2}$ cents per pound; finer than 16 wire gauge, 2 cents per pound; all other iron or steel wire, and wire or strip steel, commonly known as crinoline wire, corset wire, drill rods, needle wire, piano wire, clock and watch wires, &c., and all steel wires, whether polished or unpolished, in coils or straightened and cut to lengths, drawn cold through dies, and hat wire, flat steel wire, or sheet steel in strips, uncovered or covered with cotton, silk or other material or metal, and all iron and steel valued above 4 cents per pound, 40 per cent. ad valorem: Provided, That all manufactures of iron and steel wire, not otherwise provided for, pay the same rate of duty as imposed on the wire the articles are made from and in addition thereto 1 cent per pound." The McKinley rates are: Not smaller than No. 10, $1\frac{1}{2}$ cents; No. 10 to No. 15, $1\frac{1}{2}$ cents; No. 16 to No. 26, $2\frac{1}{2}$ cents; smaller than No. 26, 3 cents. Covered wires are 5 cents; flat wire, 50 per cent.; wire cloth, 2 cents in addition to wire duty; galvanizing and tinning, $\frac{1}{2}$ cent extra; iron rope, 1 cent extra; steel rope, 2 cents extra. The Wilson and Senate bills had a 35 per cent. general rate.

Anchors or parts thereof, of iron or steel, mill iron and mill cranks of wrought iron, and wrought iron for ships and forgings of iron or steel, or of combined iron and steel, for vessels, steam engines and locomotives, or parts thereof, 1.2 cents per pound. Present law, 1.8 cents; Wilson and Senate bills, 25 per cent.

Axles or parts thereof, axle bars, axle blanks, or forgings for axles, whether of iron or steel, without reference to stage or state of manufacture, $1\frac{1}{2}$ cents per pound: Provided, That when iron or steel axles are imported fitted in wheels or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted. Present law, 2 cents; Wilson and Senate bills, 25 per cent.

Anvils of iron or steel, or of iron and steel combined, by whatever process made or in whatever stage of manufacture, $1\frac{1}{2}$ cents per pound. Present law, $2\frac{1}{2}$ cents; Wilson and Senate bills, 25 per cent.

Blacksmiths' hammers and sledges, track tools, wedges and crowbars, whether of iron or steel, $1\frac{1}{2}$ cents per pound. Present law, $2\frac{1}{2}$ cents; Wilson and Senate bills, 25 per cent.

Boiler or other tubes, pipes, flues or stays of wrought iron or steel, $1\frac{1}{2}$ cents per pound. Present law, $2\frac{1}{2}$ cents;

Wilson bill, 25 per cent.; Senate bill, 20 per cent.

Bolts, with or without threads or nuts, or bolt blanks and finished hinges or hinge blanks, whether iron or steel, $1\frac{1}{2}$ cents per pound. Present rate, $2\frac{1}{2}$ cents; Wilson and Senate bills, 25 per cent.

Cast iron pipe of every description, $\frac{1}{10}$ cent per pound. Present law, $\frac{1}{10}$ cent.; Wilson bill, 25 per cent.; Senate, $22\frac{1}{2}$ per cent.

Cast iron vessels, plates, stove plates and irons, sadirons, tailors' irons, batters' irons, and castings of iron, not finished parts of machinery and not specially provided for in this act, $\frac{1}{10}$ cent per pound. Present law, $1\frac{1}{10}$ cents; Wilson and Senate bills, 25 per cent.

Castings of malleable iron not specially provided for in this act, $\frac{3}{10}$ cent per pound. Present law, $1\frac{7}{10}$ cents; Wilson and Senate bills, 25 per cent.

Cast hollow ware, coated, glazed or tinned, 2 cents per pound. Present law, 3 cents; Wilson and Senate bills, 30 per cent.

Wheels, or parts thereof, made of iron or steel, and steel tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotives, car, or other railway tires or parts thereof, wholly or partly manufactured, and ingots, cogged ingots, blooms, or blanks for the same, without regard to the degree of manufacture, 40 per cent. Present law, $2\frac{1}{2}$ cents on finished or partly finished and $1\frac{7}{10}$ cents on ingots, &c.; Wilson and Senate bills, 30 per cent.

The present paragraph on cutlery has been changed as bracketed. Pen knives or pocket knives of all kinds, or parts thereof, and erasers, or parts thereof, wholly or partly manufactured, valued at not more than 50 cents (30 cents) per dozen, 12 cents per dozen (25 per cent.); (valued at more than 30 cents per dozen and not exceeding 50 cents per dozen, 12 cents per dozen); valued at more than 50 cents per dozen and not exceeding \$1.50 (\$1) per dozen, 50 cents (25 cents) per dozen; (valued at more than \$1 per dozen and not exceeding \$1.50 per dozen, 40 cents per dozen); valued at more than \$1.50 per dozen and not exceeding \$3 per dozen, \$1 per dozen; valued at more than \$3 per dozen, \$2 (75 cents) per dozen and in addition thereto on all the above (valued at more than 30 cents per dozen and not more than 50 cents per dozen, 25 per cent. ad valorem: Provided, That blades, handles, or any other parts of any or either of the articles named in this paragraph, imported in any other manner than assembled in pen knives, pocket knives, or erasers, shall be subject to no less duty than herein provided for pen knives, pocket knives or erasers valued at more than 30 cents per dozen), 50 per centum ad valorem. The Wilson and Senate bills had the rate 45 per cent.

Table cutlery has been changed so as to read as follows: "Table and carving knives and forks valued at more than \$2.50 per pair, and razors and razor blades, wholly or in part finished, and scissors and shears, 40 per cent. ad valorem; all other table knives, forks, steels, and all hunting, kitchen, bread, butter, vegetable, fruit, cheese, plumb-ers', painters', palette and artists' knives; also all carving, cooks' and butchers' knives, forks and steels; all sizes of all of the above, finished or unfinished, and not specially provided for in this act, 35 per cent. ad valorem." The Wilson and House bills had 35 per cent.

The present law on files is as follows, the proposed rates being bracketed:

Files, file blanks, rasps and floats, of all cuts and kinds, 4 (6) inches in length and under, 35 cents (50 cents) per dozen; over 4 (6) inches in length and under 9 inches, 75 cents (65 cents) per dozen; 9 inches in length and under 14 inches, \$1.30 per dozen; 14 inches in length and over, \$2 per dozen (9 inches and over, \$1.20 per dozen). The Wilson and Senate rate was 35 per cent. ad valorem.

The saw paragraph in the present law has been changed as bracketed.

Cross cut saws, 8 cents (6 cents) per linear foot; mill, pit and drag saws, not over 9 inches wide, 10 cents per linear foot; over 9 inches wide, 15 cents per linear foot (mill saws, 10 cents, pit and drag saws, 8 cents); circular saws, 30 (25 per cent.) per centum ad valorem; hand, back and all other saws not specially provided for in this act, 40 (25 per cent.) per centum ad valorem. Wilson bill, 25 per cent. on all saws; Senate bill, 25 per cent. on circular and hand saws, 15 per cent. on cross cut and mill, pit and drag saws.

A new paragraph has been added, as follows:

"Umbrella and parasol ribs and stretcher frames, tips, runners, handles, or other parts thereof, made in whole or chief part of iron, steel or any other metal, 50 per cent. ad valorem."

Aluminum, in crude form, alloys of any kind in which aluminum is the component material of chief value, 15 cents (10 cents) per pound. Senate bill, 15 per cent. ad valorem; Wilson bill, 25 per cent. ad valorem.

Nickel, nickel oxide, alloy of any kind in which nickel is the component material of chief value, 10 cents (6 cents) per pound. Wilson and Senate bills free.

Trade Publications.

IN THE NEW CATALOGUE issued by John Ait & Son of New Haven, Conn., makers of machinery for straightening and cutting wire and of machinery for hardware manufacture, the description of each machine is complete in itself and each page is independent. This permits of sending a description of one particular machine, or the descriptions of just such machines as are inquired for, thereby saving the time of customers, as they do not have to read through a bulky catalogue to find what they want. The pages of the catalogue are bound together in such a way that additional pages can be inserted easily at any time.

WE HAVE RECEIVED from the Link-Belt Machinery Company of New York, Philadelphia and Chicago a special catalogue of the mining machinery made by them. This fully describes their elevators and conveyors and the many special devices made by them.

THE FANEUIL WATCH TOOL COMPANY of 474 Washington street, Boston, have issued a catalogue describing the Rivett and Crosby lathes intended for the use of watchmakers, and the Rivett milling machines and bench lathes. In their three-spindle vertical milling machine, as can be seen, roughing and finishing cutters can be used successively without disturbing the work, and the cutters can be ground on their own arbors at the back of the machine, so that the grit from the emery does not interfere with the work, nor the grinding operation with the adjustment of the cutter. The machine is equally good for large or small work. Their No. 4 bench lathe is provided with a milling and gear cutting attachment having two rotary adjustments for angles and tapers, and cutting gears up to 4 inches in diameter and 12-inch pitch, and milling cutters up to 3 inches in diameter. This lathe is also provided with the following attachments: Milling, turret,

grinding, screw cutting, &c. The tool is particularly intended for all kinds of fine work, and is especially adapted to the work of fine tool makers, model makers, electricians and watch tool makers.

THE HAYDENVILLE MFG. COMPANY of 73 Beekman street, New York, have issued a very comprehensive catalogue of their fine brass goods for water, gas and steam. This company make a specialty of fine brass work to order for first class modern plumbing, steam and gas fitting.

A PAMPHLET ISSUED by the Clonbrock Steam Boiler Works of Brooklyn, N. Y., describes the Morrin Climax steam generator built by them, and presents many testimonials from prominent firms who are now using this boiler and who have found it to work satisfactorily in every respect.

AN ILLUSTRATED CATALOGUE of grinding, polishing and electroplating machinery has been published by Cutter & Wood of 131 Pearl street, Boston, Mass. The line of tools made by this firm covers every operation in which emery in its various capacities, from abrading to the finest finishing, is used.

"THE MUNICIPAL MACHINERY" catalogue of the F. C. Austin Company of Chicago is devoted to the description and illustration of road making and street cleaning machinery. The rock crusher described in it embraces an entirely new principle, whereby the upper and lower parts of the movable jaw have an alternating, reciprocating and vibrating motion, which enables the crusher to crush stone continuously; whereas other crushers of this style crush only on the advancing motion of the jaw, doing nothing as the jaw recedes. The catalogue is very complete, the engravings are sharp and well printed and the text thoroughly covers the principal points of each device.

QUEEN & CO., INCORPORATED, of Philadelphia, have issued a circular descriptive of the Queen Le Chatelier, the Queen Mercurial, the Gauntlett and the Hobson hot blast pyrometers.

THE HARRISON SAFETY BOILER WORKS of Germantown Junction, Philadelphia, have just issued a 40-page catalogue descriptive of the Cochrane feed water heaters, feed water heaters and purifiers, special heaters and separators. The greater part of the catalogue is devoted to a treatise on the uses and advantages of feed water heaters and separators. Many pages are devoted to an illustrated description of the construction of the Cochrane feed water heaters and a general consideration of their utility for many purposes, directions for connecting and operating, an explanation of their advantages in heating and purifying and in heating systems where exhaust steam is used, and lists of prices and dimensions. The concluding pages, with the exception of the last page, contain some *fac-simile* testimonials from well-known concerns who have the heaters in use, and the last page shows the Cochrane separator. The catalogue is well printed, contains several photo engravings and plans, and is bound in fancy paper covers.

RICE MACHINERY COMPANY, 166 to 174 South Clinton street, Chicago, have just issued what is claimed to be the most complete catalogue thus far issued on power transmission machinery and auxiliary appliances. The catalogue comprises 64 large pages and treats of Dodge wood spilt pulleys, Dodge rope transmission and kindred appliances, shafting, couplings, hangers, pillow blocks, Dodge split friction clutches, electrical counter shafts, chain belting, steam goods, valves, whistles, lubricators, packing and engineers' supplies, oilers, waste, pipe fitters' tools, boilers, engines, iron working machinery, wood working machinery, vises, clamps, small tools of many kinds, &c. It is the company's aim to provide complete outfits for power plants, and in looking over their catalogue the ground seems to be very thoroughly covered. It is a very taking publication from start to finish. The cover is unique, being a lithographic representation of a wooden shop door, with the grain of the wood, knots, &c., faithfully reproduced, while signs are either nailed or painted on.

it. The envelope in which the catalogue is mailed is also worthy of note, being illustrated with a view of some brownies fishing, which is explained by the legend beneath, "fishin' for orders."

FROM MONTAGUE & FULLER of 28 Reade street, New York and 345 Dearborn street, Chicago, we have received an illustrated catalogue describing their exhibition of book binders' and printers' machinery at the World's Fair. The exhibit consisted in part of book sewing machines, folders, paper cutters, wire stitchers, automatic paper feeding machines, automatic book trimmers, embossing press and inker, &c.

A VERY COMPLETE catalogue of the deep well pumping machinery and tube well supplies made by the John H McGowan Company of Cincinnati has been received. This book includes all the improvements that have been made in this line of machinery.

CATALOGUE No. 15, issued by Byron Jackson of San Francisco, Cal., is devoted to pumping machinery, steam engines and boilers. The descriptions cover complete and varied lines of pumping machinery for irrigation, reclamation, dredging, dry docks, paper mills, tanneries, wrecking and city water works, &c.

THE WEEK.

The Antwerp International Exposition was formally opened by King Leopold on May 5 in the presence of 40,000 persons. It will remain open until November 2. As usual with similar exhibitions, the interior arrangements are still incomplete, the greater part of the exhibits not being yet in place.

The canal season in New York State opened on May 1 under favorable auguries. Upward of 300,000 tons of merchandise were carried into the Erie Canal, an increase of 50 per cent. over the same period in 1893, while at least one third more boats were locked in at Albany than when the season opened last year.

A decision of importance was handed down last week by Justice Brewer of the United States Supreme Court, denying the right of certain Southern and Western States to levy the interstate commerce tax imposed on commercial travelers. A Chicago salesman recently visited Titusville, Pa., and, not having taken out a license, was fined \$25. The judgment was affirmed, on appeal, by the Supreme Court of Pennsylvania. Justice Brewer in reversing this judgment said: "No State can levy a tax on interstate commerce in any form, whether by way of duties laid on the transportation of the subjects of that commerce or on the receipts derived from that transportation, or on the occupation or business of carrying it on." This decision will set at rest a long disputed question, and will be hailed with approval by the traveling fraternity.

A sample consignment of 500 tons of compressed fodder, manufactured in the United States, has been ordered for the British Army through the Government contractors.

The experts' report of the Midwinter Fair at San Francisco shows it to have been a complete financial success.

Robert Giffen, the eminent English statistician, has just issued a table comparing the trade of England, France, Germany and the United States in the period from 1890 to 1892. This table shows that the imports and exports have increased as follows: Imports—Germany and the United States, 33 per cent. each; England, 13 per cent., and

France, 6 per cent. Exports—United States, 26 per cent.; France, 14 per cent.; England, 10 per cent., and Germany, 15 per cent.

An institution of a somewhat unusual character was opened on Saturday, in Webb's Academy and Home for Shipbuilders, at Fordham Heights, New York. The institution, which is admirably equipped, is the gift of William H. Webb, who has expended nearly \$500,000 upon it, in the way of buildings and endowment. It is intended that 60 old shipbuilders and their wives shall occupy a portion of the building, and 60 young men shall be instructed there in theoretical ship construction, with the view of fostering the American shipbuilding industry.

The prospect of a scarcity of bituminous coal in Chicago, consequent on the miners' strike, is being regarded with equanimity in many quarters of the city. There is plenty of hard coal on hand and it is fondly hoped that the enforced use of this fuel may be a means of abating the smoke nuisance.

Last week witnessed the removal of several of the biggest insurance companies of this city into their newly built quarters. The Manhattan Life took possession of its new structure in lower Broadway and the Home Life moved into its marble palace opposite the City Hall Park, while the Mutual Reserve occupied its new 15-story building at Broadway and Duane street. These structures are among the most massive and striking of the latest additions to the business end of New York.

The Brooklyn dry dock question has been settled by Secretary Herbert, who allows the present contractor to continue the work under certain specific conditions, of which the most important is that the work shall be pushed on as rapidly as possible. The Department reserves the right, however, to abrogate the contract at any time if the progress is not satisfactory.

Visions of a coal famine are haunting the minds of Western manufacturers.

In some of the agricultural districts of Pennsylvania the demand for small farms is said to be greater than has been ever before known.

The Lyons exhibition of arts, sciences and industries was formally opened with great ceremony on Sunday, April 29, although it will not be ready for the public for some weeks to come. The site of the exhibition, the famous Parc de la Tête d'Or, is magnificent, inclosing a beautiful lake and bordering on the river Rhine. The main building covers 5000 square yards and is surmounted with a fine cupola. Handsome pavilions containing the various classes of exhibits are scattered about the grounds.

A high tower is to be constructed at Fredericksburg, a suburb of Copenhagen, by Colonel Somefeldt. It will be 600 feet high. The Danish Minister of War has reserved the right to use the top as a military observatory.

A company is being formed in Scranton to manufacture a bearing metal under the patents of Benedict Millhauser. Experiments, which are reported to have been successful, have been made on cars of the Delaware & Hudson Canal Company and the Erie & Wyoming Railroad. The Delaware & Hudson Company had one of the bearings on a car which was run 13,680 miles in

120 days. When the bearing was removed scarcely any wear was perceptible. It has also been used in mine pumps subject to corrosion from water containing sulphuric acid.

New Publications.

ELEMENTARY METAL WORK. A Practical Manual for Amateurs and for Use in Schools. By Charles Godfrey Leland, late Director of Industrial Art Work in the Public Schools of Philadelphia. Macmillan & Co., New York, 1894. \$1.50.

In this volume Mr. Leland has put into the hands of students of art metal work a manual which appears to be a very complete and helpful guide to the mastery of this fascinating craft, beginning with its first principles and carrying the instruction through to the highest stages. Although designed, as its subtitle indicates, mainly for use in schools and for the benefit of the amateur metal worker, the book goes very thoroughly into the art of decorative working in sheet metals, and contains much matter which would render it useful to practical metal workers. The book is devoted to an exposition of the processes of cold metal work, beginning at the rudiments and working steadily along into the most advanced forms of artistic and decorative work. It is divided into six portions, treating respectively of bent iron or strip work, flat sheet metal work, molded sheet metal work, *repoussé* or embossed metal work, ornamental silver work, and nail, scale and stencil work. The illustrations, 124 in number, are of excellent quality, and include engravings of all the tools and appliances used in the manipulation of cold metals, samples of elementary forms and curvatures, and a wealth of artistic patterns, with examples of the best ancient and modern metal work. Directions are given for making rings and curves of strip metal into objects; for soldering, shearing, chiseling, fret sawing and pressing sheet metal; for embossing sheet metal on wood and on pitch, and for every phase of cold metal working. The book contains 110 pages, is handsomely gotten up on thick paper, and bound in an artistic cover of black and bronze, making it a very attractive volume.

THE TIN MILL READY RECKONER. By Ambrose Beard, New Philadelphia, Ohio. Price, 75 cents.

Mr. Beard's "Tin Mill Ready Reckoner" is a handy little pamphlet which contains a series of tables of calculations for quickly computing the wages of tin mill rollers, doublers, heaters and shearmen under the Western scale.

The entire stock of roofing sheets held by one sheet mill was bought at market prices by a Canton concern, and there is a good demand for all that can be turned out by those mills in operation. The stoppage has become a source of annoyance both to buyers and mill operators, and no relief is expected for at least two weeks to come.

The President has appointed the following Commissioners to attend the Antwerp Exposition on the part of the United States: George V. Massey of Delaware, Commissioner General; Henry W. Gilbert of New York, E. A. Ewing of Illinois, F. A. Gamon of Washington State, and Alphonse Le Duc of Louisiana.

The Iron Age

New York, Thursday, May 10, 1894.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The New Senate Bill.

After months of dickering, during which the business of the whole country has suffered all the agonies of suspense, the majority in the Senate have at last put forward modifications of the Wilson bill which are supposed to assure a passage of the greatly modified measure through the Senate. To what extent further negotiations will be necessary is still an open question which possesses relatively little interest, because ultimately the final bill will be shaped in the hurly burly of the sessions of the Conference Committee. The misfortune is that the latest developments give no assurance that further drastic measures are not possible.

So far as the iron and steel trades are concerned the new Senate bill is a distinct improvement on the Wilson bill and on the measure of the Senate Finance Committee, because the vicious and dangerous ad valorem rates have been largely replaced by specific duties. Manufacturers and honest importers, under the latter, know what they must figure on and can prepare themselves accordingly. We print elsewhere the changes proposed, contrasting them with the rates established under the present law.

It will be observed that there are heavy cuts all along the line, which on some articles are perilously near the danger point, if business in this country should again develop, as it has done repeatedly in the past, in such a way that we are the leaders in a rapid advance. We have repeatedly called attention to the fact that the present condition of affairs is abnormal and that any comparisons made or conclusions drawn from them are unfair to the American iron industry. No one familiar with the trade will deny that at present prices foreign makers cannot compete in our markets. But we are convinced that all will agree that it is not to the best interests of the country that present wages and present losses to capital should be perpetuated.

A reduction in the duty on pig iron and scrap from \$6.72 to \$4 per ton, on steel rails from \$13.44 to \$7.84, on billets from \$8.96 to \$6.72, on wire rods from \$13.44 to \$8.96 per gross ton, on beams and structural shapes from 0.9 cent to 0.6 cent per pound, is very heavy. It must not be forgotten that the prices so freely quoted by those who oppose the present law are those made at the interior, and that Eastern works cannot now nor do they expect to be able during the next decade to reach them

at tidewater markets under the most favorable circumstances.

American prices for iron and steel at the present time are the result of an extraordinary coincidence of circumstances. They are due to the fact that the opening of new ore regions has pushed values of ore down to figures which dearer mining and a desire later on for realizing some profit will materially change within a year. Coke has been selling below cost. Freights and wages are down to prices which only the panic can account for. If this state of affairs were not giving to Western works extraordinary advantages in reducing cost, if it held out any promise of becoming even approximately a normal condition, then the Eastern furnaces and mills which could live could be counted on the fingers of one hand. But it is not, and while the future of the plants east of the Alleghany Mountains is far from being rosy hued, the conviction that the time will come when they can again be operated at some profit buoys them up with some hope. Radical tariff legislation would destroy even that shadow of consolation.

Sensible Stove Manufacturers.

The stove manufacturers conduct their business very differently from their colleagues in other branches of the iron trade. While prices generally have been not merely reduced but savagely cut until not a semblance of profit can be detected in most staple articles of iron and steel, the manufacturers of stoves have refused to be stampeded and have maintained their schedules. They have seen the demand for their goods shrink steadily 10, 20 and even 30 or more per cent. below their customary volume of business, but have not sought to stimulate the drooping trade by offering stoves at lower and lower prices. In recent years margins of profit have been very slight, owing to increasing competition, and it would have been supposed that the competition for business would be more severe than ever when trade fell off. Yet this was not the case. Conservatism and philosophy ruled in the councils of the stovemakers instead of blind frenzy and a rash desire to keep selling. When they found their warehouses getting uncomfortably full of stoves which could not be sold they shut down their foundries and waited for trade to improve. From time to time, as their stocks were drawn upon by the requirements of the trade, they resumed work in the foundries.

Thus has the stove business gone forward, not by any means to the satisfaction of the makers, but with far less friction than in many other lines. Workmen employed in the foundries have not struck because they had no incentive to strike, as their wages were not reduced nor has a reduction been even threatened. Stocks of stoves in dealers' hands have suffered no depreciation in value through the action of the manufacturers, which can hardly

be said of any other goods carried by them. The fact seems to have been universally recognized that stoves are cheap enough and sold at figures sufficiently close, so that reductions in price if made would not have enlarged the consumption. It is doubtful if a single consumer who needed a stove during this panicky period made an argument for a lower price based on the decline in other goods. In fact, the reductions in prices on such goods have not been made to any extent in compliance with the views of consumers, but have almost wholly been brought about by the action of the manufacturers themselves. The stove manufacturers propose to continue this policy. At their recent convention in Chicago they passed a resolution that in view of the decreased demand for stoves and the maintenance of the old scale of wages paid their workmen, which had materially enhanced the cost of production, making the selling price so nearly approach the cost, a rigid adherence was obviously required to existing prices and terms, and that it was the sense of the convention that such prices and terms should be firmly maintained during the year 1894. The manufacturers are undoubtedly of the opinion that the depression in business is only temporary, and they seek to prevent a demoralization in their trade and disaffection among their workmen which might not only lead to serious consequences now, but be felt injuriously for some time after the depression passes away.

It is worthy of note in this connection that the stove manufacturers have been able to maintain their prices without the formation of a trust or a combination, or even the semblance of one. They have two national associations, one for defense in case of labor troubles and the other for the mutual interchange of ideas on subjects connected with their business as manufacturers. Neither of these, however, regulates prices. And yet, with no machinery whatever in operation to bolster up one another, they maintain their rates against adverse circumstances which have wrecked combinations of almost every kind. They are a shining example for other manufacturers who have steadily parted with every advantage given them in reducing costs, as if they were in business only for the benefit of the dealer and the consumer.

In referring to the records made at the Ensley plant of the Tennessee Coal, Iron & Railroad Company when dealing with the last annual report of that corporation, we expressed the impression that the recent records of production were due to a concentration of blowing power on the part of the plant which was in operation. In March, 1894, two Ensley furnaces made 6091 tons per furnace, as against 3441 tons in the corresponding month of 1893. We are advised now that we are mistaken, since the records are made by the furnaces which are now at work

at Ensley, each one using its own blowing engines and its own boilers, not borrowing a single engine or a single boiler from those furnaces of the plant which are standing idle. We freely confess that such an improvement in one year is unparalleled in the history of iron making in this country, since it amounts to nearly a doubling of capacity, and that, considering the grade and character of the ores used, it is fully abreast of the very best practice in this country.

OBITUARY.

CAMPBELL B. HERRON.

Campbell B. Herron, the well-known iron manufacturer of Pittsburgh, died at his residence in Allegheny City, Pa., on Saturday morning, the 5th inst. Mr. Herron was born in Allegheny on August 2, 1828, and had resided his entire life within the block in which he died. He received his education in the common schools and commenced his business career as a shipping clerk with the firm of Spang & Co., who were engaged in the iron business in Pittsburgh more than 50 years ago. In 1858 Mr. Herron organized with a junior member of the Spang family the firm of Spang, Chalfant & Co., into which the older firm were afterward merged. In this concern he was a partner and maintained his interest up to his death. For some years Mr. Herron was chairman of the Wrought Iron Pipe and Tube Manufacturers' Association, and was also chairman of the Spang Steel & Iron Company, who are an identified interest of Spang, Chalfant & Co. He also usually represented his firm in the yearly negotiations with the Amalgamated Association over the wage scale. He was a director in the Exchange National Bank of Pittsburgh.

SAMUEL SUMMERS.

Samuel Summers, for some years secretary and treasurer of Summers Brothers & Co., Struthers, Ohio, died in that city on April 28 of typhoid fever, after an illness of four weeks. He leaves a wife and three children.

Nickel Aluminum.—At the last meeting of members of the Society of Mechanical Engineers specimens of nickel aluminum were exhibited which had been sent by Alfred E. Hunt of the Pittsburgh Reduction Company. One specimen was a rectangular bar, 18 inches long, $1\frac{1}{2}$ x $\frac{1}{4}$ inch, which was bent in the middle and had a permanent set of $\frac{1}{4}$ inches. This had been tested under transverse test, it taking 400 pounds to deflect the sample to the amount given, the distance between the supports being 16 inches, center to center. A similar piece of 66,000 pounds tensile strength steel, with 23 per cent. elongation in 8 inches, took exactly the same load—400 pounds—to deflect to exactly the same amount. Another sample of nickel aluminum had a $\frac{1}{4}$ inch hole bored into it and enlarged by blows of a sledge upon a drift pin to 2 inches. This is a test which steel would by no means have stood.

The Rose Polytechnic Institute lays a special emphasis on the practical side of technical education which it is enabled to do throughout the whole course of four years by its shops and laboratories and complete outfit, especially in electricity.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., May 9, 1894

The Tariff.

The armistice which was called in the tariff controversy in order to give the majority members an opportunity to try their hand at a compromise measure, resulted in a vast amount of conferring and the consideration of a diversity of propositions.

This, however, was only reached after the defeat of the Voorhees bill seemed inevitable. The House bill had it been brought to a vote would have been defeated in the Senate by a majority of nine at least. The Voorhees bill if brought to a vote would have been discarded by five majority. These facts were established. The latest effort to turn out a bill by amendments, which will receive support, is being conducted by Senator Gorman. The Maryland Senator has always been in favor of moderate protection. This is the line he has been working upon in order to bring about an adjustment of the dissensions which have existed among the majority.

The Senator submitted a very radical return to the specific system where it existed before. There has been much opposition placed in his way in the metal schedule.

It will be recalled that the Voorhees bill went even lower than the ad valorem rates of the Wilson bill. These Mr. Voorhees agreed to restore, but this was not satisfactory to Mr. Gorman, who desired specific rates where they had existed before and an increase up to a higher plane. The Senator, for instance, favored \$8 a ton on steel rails, a compromise rate between the existing rate and the ruinously low figure of the House and Senate bills. The same rule Mr. Gorman tried to apply to blooms and other ruder forms of steel and iron.

There is an evident feeling of desperation in the ranks of the majority. They are now planning to force an issue on the subject of consideration, with a view to curtailing debate as much as possible.

According to the best authorities among the Senators there will be no bill passed by June 1, as some predict.

Secretary Herbert and Captain Reade, U. S. Marine Corps, as aide, left for the Pacific Coast on Saturday to inspect the Mare Island Navy Yard and other points in that vicinity.

The Armor Trouble.

One of his last acts was the designation of Commodore W. T. Sampson, Chief of the Bureau of Ordnance, to conduct, with the assistance of two expert naval officers, the extended investigation of the alleged frauds of the Carnegie Company in the manufacture of armor plates and the allegations against the Sterling Steel Company in the manufacture of armor piercing shot. Commodore Sampson has held several meetings of the board. These were preliminary to the regular investigation, the scope and details of which he now has under advisement. The charges of Ex-Burgess McLuckie of Homestead and others who were employed in the Carnegie works have been supplemented by allegations made by Attorney Wallace of Pittsburgh, who was given an extended hearing, during which he submitted a number of affidavits, with a statement that more would be forth-

coming. In conversation with the correspondent of *The Iron Age* Commodore Sampson said: "It is too early to say with much precision what course the investigation will take. We will first get together the information which it is proposed to submit, and we will then be able to better determine to what extent we are justified in carrying the investigation. The history of every plate is a matter of record; therefore we can easily follow them up."

The Commodore evidently intends to make his work very thorough and will endeavor to discover the guilty parties: first, the men who were in immediate charge of the work, and after that he will try to ascertain, in event of the additional frauds being established, whether higher officials of the company were cognizant of the frauds. Commodore Sampson will examine all witnesses who have anything to say.

The allegations which have been circulated through the newspapers and by certain parties, from motives best known to themselves, concerning collusion between the manufacturers of armor plate and the Sterling Steel Company, manufacturers of armor piercing shot, are recently characterized in official quarters as newspaper "rot."

In speaking on the subject a high naval authority observed that the foolishness of these charges about the Sterling Company can be established by considering several propositions. He said:

"Now, it is charged that for a consideration the Sterling Company have agreed with the manufacturers of armor plate to make a shot which will not damage the plate to the extent of preventing acceptance. The fact is the Sterling Steel Company have a shot which possesses great merit. We are now testing it. A shot to be accepted must penetrate the plate—I mean go through it. Any one with common sense would know that there is more in making a shell which will go through and demolish the plate than in making an inferior quality which will not, and in collusion with the armor plate men. One or two shells which do not come up to the requirements would be sufficient reason for abandoning their use entirely. So you see that sort of talk is the sheerest nonsense. Besides, in a lot of shot we pick out any one we please and test them. The rivalry, too, among the makers of shot will also tend to keep them up to the standard."

The officer added: "In the face of these allegations take the results of the tests of two of these very Sterling projectiles at Indian Head last Saturday. One was a 12-inch and the other a 13-inch. They were fired into a 12 inch Harveyized plate made for the battleship "Texas." The 12 inch shot not only went through the 12 inches of plate and several feet of wood backing, but 12 feet of sand, and was found entire and uncracked. On the other hand, the corner of impact of the plate was badly shattered. The 13-inch projectile also went through the plate and was found 350 feet in the rear uninjured. The plate was a complete wreck. This damage was done at a velocity of 1500 foot seconds. The Sterling and the Carpenter projectiles are now the best in the world."

The British consul at Stockholm Sweden, reports that De Laval has patented a method of smelting iron ore by electricity. The first experiment on a large scale is to be made at Trollbättan, where one of the principal waterfalls has been leased for the generation of the electricity required.

The Cost of Rolling Sheet Steel.

The coming convention of the Amalgamated Association of Iron and Steel Workers, at Cleveland, Ohio, next week is not expected to be productive of any serious questions, excepting so far as sheet mills are concerned, and in that branch of the iron and steel industry a great variance of opinion exists. Sheet mill operators feel confident that a reduction in wages must be accepted by the workmen, and on the other hand local leaders of the workmen state that employers will have cause for gratification if an advance is not asked for, and the prospect of a reduction being accepted is considered highly improbable. During the past six months the principal sheet mills have been run steadily, and those who constitute the saving element among the men are in good shape financially for a summer vacation, but even they feel the drain of helping to support those locked out at Apollo, Leechburg and elsewhere, and ammunition in the shape of hard cash is not available in very large amounts for the expected fight.

Without expressing an opinion in regard to justification of a fight brought about by either side, there are some cold facts that will be brought to notice when a conference takes place. Foremost among these is the steady decline in prices of sheet iron and steel during the time elapsed since the last agreement was reached.

Immediately after the last settlement was made both buyers and mill owners grew confident. It was felt that bottom had been reached. Contracts were made and buyers got the worst of it. Concessions were made and contracts in most instances were adjusted upon a new basis, sheet mill operators preferring to do this rather than lose good customers. A week ago even these concessions and adjustments made prices seem high, but the sudden cessation of operations due to the coal miners' strike has changed the aspect of affairs, and better prices rule for what little material is being made.

Taking the figures ruling two weeks ago as a basis, there are good grounds for doubt as to whether or not a profit can be expected as a result of making No. 27 gauge sheet steel at \$2.20 f.o.b. works, a price only obtained by the best concerns from old customers who had faith in the product of the mills with whom they had dealings.

It would not be a fair estimate of cost to accept as a standard the results obtained at any one mill, but an average cost under varied conditions may be arrived at by considering figures collected from different centers where coal is used as fuel. The fuel cost of course varies very much, but the figures hereafter presented are fair as an average.

In presenting these figures it should be further remembered that no two companies operate sheet mills under exactly similar conditions and general costs can only be ascertained by grouping the various methods of operation and averaging results. As a standard of cost sheet mills having a capacity of at least 600 tons per month and having their own sheet bar mills and conveniences for reworking scrap will be considered. On that basis it will be found that there is very little in it, if anything, to make No. 27 sheet steel at \$2.20 per 100 pounds f.o.b. mill, with billets averaging \$16.25, delivered. The prices at which contracts are now being offered by Western buyers are based on \$2.15 at mill. If orders are

accepted on that basis manufacturers will have a cost account to contend with something like the following:

prietors of the Star Iron Works, Allegheny, Pa., and president of Allegheny Select Councils, is lying very ill at his

Cost of Making Steel Sheet Bars.

BASIS OF COST.—Steel billets \$16.25 per gross ton, delivered.
Coal, run of mine, \$1.10 per net ton, delivered.

Capacity of plant 600 tons finished sheets per month, equipped to rework crop ends and sheet scrap.

Cost of Converting Steel Billets to Sheet Bars, Deducting all Scrap Returned to Bar Mill.

Finished sheets required.....	2,240	
Furnace waste.....	4 per cent.	
Crop ends.....	7 per cent.	694
Waste from bar to sheet 20 per cent.= 31 per cent.		
Billets required to make 2,240 pounds finished sheets.....	2,934 pounds at \$16.25 per gross ton	\$21.29
SALVAGE:		
Crop ends, 156 pounds at 60 cents per 100 pounds		\$0.94
Sheet scrap, 18 per cent., 403 pounds, at 25 cents per 100 pounds		1.01
		1.95
Net cost of steel billets to make 2,240 pounds sheets.....		\$19.34
LABOR COST, BAR MILL:		
Unloading, piling, heating, rolling and all help at rolls paid by the ton.....		1.58
Day labor at rolls and proportion of general labor.....		1.15
Proportion of repairs, expenses, salaries, &c.....		.75
COAL:		
Gas furnace and boilers.....		.38
Cost of bars to make 2,240 pounds sheets.....		\$23.20
Cost of bars per 2,240 pounds sheared to length.....		\$18.97

Sheet Mill Cost Account—No. 27 Gauge Steel.

Cost of sheet bars to make 2240 pounds finished sheets (see statement above), 2638 pounds at.....	\$23.20
Coal.....	2.50
Repairs, renewals of rolls and other machinery.....	1.25
Taxes and office expense.....	1.00
Commission and cash discounts.....	1.00
Grease, oil and supplies.....	.50
Contingencies, such as breakages, delays on account labor disputes and unforeseen occurrences.....	1.50
Labor—rolling, heating and shearing.....	\$9.00
Ten per cent. added for steel.....	.90
	9.90
Roll hands paid by the day.....	2.43
General labor, engineers, millwrights, common labor, &c. (sheet mill proportion).....	2.65
Annealing, weighing and shipping.....	.80
Cost per gross ton, 2240 pounds.....	\$46.73
Cost per net ton, 2000 pounds.....	41.72
Price now offered by Western jobbers for summer and fall deliveries No. 27 steel f.o.b. mill, \$2.15 per 100 pounds.....	43.00
Estimated margin of profit under most favorable conditions, per net ton.....	\$1.28

In the foregoing statement it is shown that the price of sheet steel has reached bottom, and no further reductions can be made unless concessions are made by the workmen. Whether or not this will occur, the result of coming conventions and conferences will determine. It is safe to say that no company will be willing, nor could they very long operate if they were willing a plant in which upward of \$100,000 cash must necessarily be invested for a meager possible profit, under favorable conditions, of \$1.28 per ton and a capacity, running an average of ten months during the year after counting time lost during the heated term, of about 600 tons per month. Another loss to be considered is excess of fuel burned when mills are laid off because hands are overcome by heat, &c. These figures are facts and there are many among workmen who are aware of them. Buyers who have not yet placed their fall contracts will realize the truth of this statement later on unless wages are reduced. Meanwhile, however, sheet mills are encouraged by reliable reports to the effect that the most important sheet mills have nearly all the orders they can fill between now and July 1, and none of them evince any disposition to sell for deliveries extending beyond that time. It is a further source of encouragement to know that jobbers' offers of \$2.15 have not been met.

ANONYMOUS.

James H. Lindsay, senior member of the firm of Lindsay & McCutcheon, pro-

residence in the above city with a complication of diseases, and his recovery is considered very doubtful.

Early Manufacture of Connellsville Coke.

From a recent issue of the Connells-ville, Pa., *Courier*, we take the following:

Andrew Walker of Morgan, one of the old coke makers, furnishes some very interesting reminiscences concerning that period of the industry from the opening of the Pittsburgh & Connellsville Railroad, in 1855, to the construction of the old Fayette Works, the first works of any importance built in the region. During the interim from the construction of the first coke ovens by John Taylor, Provance McCormick and James Campbell, in 1841, to the date of the opening up of railway transportation in 1855, coke was made right along and sent to market in boats. The history of the industry during this primitive period has never been written. Walker furnishes some very interesting facts concerning it, which are now printed for the first time.

The poor reception accorded the first offer of Connellsville coke by Taylor, McCormick & Campbell, in the Cincinnati market, drove the pioneer coke firm out of the business. The Cochrans subsequently tried their hand at the trade. They took two boat loads of coke down the river. The reputation of the new fuel was then made, and the Cochrans had no difficulty in selling their cargo for a good round price. Their success induced others to go into the business, and by the close of the first decade in the history of the coke trade there were no less than 13 establishments. None of them were very large, as may be inferred from the fact that the aggregate number of ovens was only 35.

Col. Alex. Hill, father of Col. A. J. Hill of Vanderbilt, had a plant of six ovens at the head of Dawson Island. He subsequently built a plant of two ovens at the lower end of the present Fort Hill Works. The ovens in those days were constructed with a special view to convenience in loading coke into the flat boats in which it was conveyed to market. The boat was built convenient to the ovens and high enough on the shore to be above the ordinary stage of

water. As the coke was made it was wheeled into the boat. The latter was allowed to remain on *terra firma* until a rise in the river floated it off. The coal back of Fort Hill was sold out in drifts, and the purchasers formed quite a coterie of coke makers on that side of the river. William Beall had two ovens; Henry Walters, proprietor of the Smith House in Connellsville, then known as the Walters House, had two ovens; Richard Brookins had a one-oven plant; a man whose name Walker does not remember had two ovens adjoining and John Moreland had two ovens. On the opposite side of the river Henry Strickler had a plant of three ovens at the lower end of the present Tyrone Works. John Barnhart of Connellsville operated them, making the coke for \$1.25 per 100 bushels, which was the usual price paid then. Jacob Strickler owned the land where the Sterling Works are now located. He sold his river front to Stewart Strickler, Asa Huntley, Silas White and Abraham Bowers. Strickler put up six ovens. Four of these were 60-bushel ovens and two 45-bushel ovens. They were the largest ovens on the river. Huntley lived in Connellsville. White had two small ovens. He and Huntley operated their own ovens. They dug their coal and drew their coke, stockpiling it upon the river bank until they accumulated a boat load, when they would sell it to some of the people who "boated" it to market. Abraham Bowers was a brother-in-law of Stewart Strickler. He owned three ovens. Bowers was a shoemaker and lived at Morgan station in the property now owned by Thomas Johnston. He made shoes and employed others to make his coke. The John Taylor ovens were being operated at the same time.

The region was accordingly made up of the following works:

Alex. Hill.....2	Henry Strickler.....3
Wm. Beall.....2	Stewart Strickler.....6
Henry Walters.....2	Asa Huntley.....2
Richard Brookins.....1	Silas White.....2
John Moreland.....2	Abraham Bowers.....3
Unknown.....2	John Taylor.....2

The National School of Electricity.

Final charter papers have just been granted by the State of Illinois to the National School of Electricity, an organization that grew out of the electrical department of the World's Fair and a course of lectures inaugurated by Professor Barrett, chief of the department, just before the fair came to an end.

The school is intended to provide a practical education in electricity to those who cannot take the time or have not the means to attend an electrical school.

Professor Barrett, chief of the electrical department of the World's Fair and chief electrician of Chicago, is at the head of the Illinois corporation, and Thomas A. Edison heads the faculty of educators. The faculty is made up as follows: Mr. Edison, dean; Nikola Tesla, Dr. Elisha Gray of Highland Park, inventor of the telautograph, Prof. H. S. Carhart of Michigan University, Prof. William A. Anthony of New Jersey, Prof. H. J. Ryan of Cornell, Prof. F. A. C. Perrine of Leland Stanford University, California, Prof. George D. Shepardson of the University of Minnesota, Prof. B. F. Thomas of the University of Ohio, Prof. D. C. Jackson of the University of Wisconsin, Prof. Brown Ayres of the University of Louisiana, Prof. M. O'Dea of the University of Notre Dame and Prof.

Barrett. It would hardly be possible to select a stronger list of names in any profession than these.

It is the intention of the founders of the school to inaugurate classes in electricity in every city and town where the population will justify it, and to teach the practical side of the subject by means of weekly lessons, presented by specially selected local instructors. Apparatus will also be furnished to the classes, and students will be given every advantage to enable them to become practical as well as theoretical electricians.

An important feature of the school is that the tuition fees are to be fixed at a nominal price, within the reach of even the poorest boy or man, \$10 or \$12 for the course having been agreed upon as the fee. Another feature that will appeal to many is that the system of teaching is to be so simple that students of very limited education will be able to fully understand everything taught.

A certain percentage of the tuition fees is to be set aside for the establishment of a scholarship fund, and will be used to send the best students of the school to college for the completion of a scientific education.

Active work has already begun, a prospectus has been issued and classes are to be started at once in Chicago, New York, Philadelphia, Boston, Baltimore, Pittsburgh, Cincinnati, St. Louis, Minneapolis and San Francisco, and as rapidly as possible in other places. Many prominent men besides the faculty and founders are patrons of the school, and it bids fair to take a prominent place as an educational institution.

The offices of the school are to be located in the Monadnock Block, Chicago, with Dr. J. Allan Hornsby, assistant chief of the department of electricity at the World's Fair, as secretary.

Mineral Production of Great Britain.

A summary recently issued by the British Board of Trade give the quantities of the various kinds of minerals raised from mines in the United Kingdom during the year 1893 as follows, comparison being made with the previous year:

Mineral Produce of the United Kingdom and of the Isle of Man.

Description of mineral.	1893. Tons.	1892. Tons.
Alum clay (bauxite)....	8,740	7,322
Arsenic.....	5,976	5,114
Arsenical pyrites.....	3,036	4,497
Barytes.....	22,343	24,247
Clays (excepting ordinary clay).....	3,058,208	3,103,852
Coal.....	164,325,795	181,786,871
Copper ore.....	5,346	5,995
Copper precipitate.....	230	270
Fluor spar.....	215	171
Gold ore.....	4,489	9,090
Gypsum.....	143,498	147,540
Iron ore.....	11,203,476	11,312,675
Iron pyrites.....	15,837	13,967
Lead ore.....	40,808	40,024
Manganese ore.....	1,396	6,078
Ocher, umber, &c.....	10,534	12,131
Oil shale.....	1,956,520	2,089,937
Phosphate of lime.....	3,300	12,200
Salt.....	1,924,029	1,956,524
Slates and slabs.....	438,993	418,241
Strontia sulphate.....	5,812	5,066
Tin ore.....	13,689	14,329
Wolfram.....	22	125
Zinc ore.....	23,754	26,880

The decrease in the coal output, amounting to about 16,500,000 tons as against that of 1892 and 21,000,000 compared with the production of 1893, was a natural consequence of the prolonged stoppage of work on the part of the miners. The falling off in the production of iron ore was comparatively slight, yet it was the smallest given in the returns for any year since 1873.

The Coal and Coke Strikes.

There is so much uncertainty concerning the effect upon current production of the coal and coke strikes that we have obtained telegraphic advices from a number of points. We present elsewhere data relating to the blast furnaces, which are generally most quickly affected.

New York.

The Tonawanda Iron & Steel Company, at Tonawanda, N. Y., advise us that they will bank their furnace until they can get coke.

The Buffalo Furnace Company telegraph that their furnace was banked on Thursday last on account of the coke strike.

The furnace of the Troy Steel & Iron Company, Troy, N. Y., is now idle.

Pittsburgh.

Phillips, Nimick & Co. are closed down for want of coal. Shoenberger & Co. are idle to day, but expect to be in operation to-morrow. Zug & Co. are idle, but have plenty of coal. A number of other mills will probably be compelled to close within the next few days unless a supply of coal is received. The fact that a number of mills in the Pittsburgh district are using natural gas to some extent, thereby enabling them to economize in the use of coal, is helping them out considerably. Mills along the Allegheny River, such as Park, Brother & Co., Limited, Carbon Steel Company, Crescent Steel Company and other concerns, depend on gas nearly altogether, and will doubtless be able to run right along. In blast furnaces two Carrie are off, two Edgar Thomson, one Eliza, two Isabella, two Lucy, two Monongahela and two Shoenberger.

Chicago.

Not a mill nor blast furnace has thus far been obliged to shut down in this vicinity on account of the coal strike. The Illinois Steel Company are using oil in their mills at South Chicago, Joliet and Milwaukee. Their other mills have not been running this year. They are operating five blast furnaces at South Chicago, one at Joliet and one at Milwaukee, getting some coke from Connellsville and some from West Virginia. They expect to keep all running. Iroquois Furnace is good for a week or ten days yet, and may get a supply from West Virginia after that. The Northwestern Company's Sidney Furnace has three to four weeks' supply of coke on hand. The Calumet and the East Chicago Rolling Mills are using oil. Waukegan has plenty of coal. The Lake Side Nail Company may have to shut down at the end of the week.

The Shenango Valley.

John Stevenson, Jr., of New Castle wires us the following on the situation: During the last 30 days the Mahoning and Shenango Valleys sold 200,000 tons of Bessemer pig, the Shenango Valley Steel Company alone taking 70,000 tons. No stocks are left, everything having gone off, Bessemer included. At Sharon, Sharpsville, Middlesex and Newcastle every blast furnace is idle. There is no coke except that of the Sharon Iron Company. Sharon, Middlesex and Greenville mills are all idle, there being no coal. At Newcastle 3000 tons of coal are on stock. The mills are all running to the very utmost capacity. The Shenango

Valley Steel Company are making 650 tons billets daily, the Wire Nail Company are producing 3600 kegs daily, the tin mill 50 tons and the sheet mill 400 tons daily. Prices here show a sharp advance. Bessemer pig is \$11.50, billets \$17.75 to \$18 and nails \$1. Newcrs'le can run two weeks longer.

The Johnson Company of Johnstown, Pa., telegraph: We are not stopping for want of coal. Have fuel enough for two weeks' run.

The Mahoning Valley.

J. G. Butler, Jr., of Youngstown telegraphs to us as follows:

The furnaces are all banked. No mills are entirely idle. The finishing mills are running two-thirds time. The puddling department one-half time. The mills have about two weeks' supply of fuel. There is no coke in sight.

Cleveland.

The American Wire Company send us the following message: We have not been compelled to shut down any part of our plant. We have enough coal to run until June 1, thanks to J. H. Somers Fuel Company.

Wheeling.

F. J. Hearne of the Riverside Works, Wheeling, telegraphs: Manufacturers of this district have been fairly well supplied with coal for finishing departments, though scarcity of Bessemer pig caused by coke strike will close every Bessemer plant within a few days. The Junction Furnace is the only one in operation. It will stop this week.

The South.

James Bowron of Nashville, Tenn., secretary of the Tennessee Coal, Iron & Railroad Company, telegraphs to us as follows:

Sloss has blown out two furnaces. Ours are still running. The output of coal by free labor is increasing daily. Strikers are hungry, desperate, threatening violence and appealing for public charity. One mine was wrecked yesterday on Horse Creek, Walker County, by strikers with dynamite. The Birmingham district is smoldering, but apparently under control.

The Sloss Iron & Steel Company telegraph: The Tennessee Company are working three mines besides convict mines. This company are working only convict mines. We expect to start one of the biggest mines next week. Everything is very quiet and orderly.

The Woodward Iron Company send us the following: There is no change in the general situation from last week except that there was a disturbance at Horse Creek on Sunday night. All the miners around Birmingham are orderly but determined. We can see no immediate end to the trouble. Some men are working at the Pratt mines and at Blue Creek. All the Sloss furnaces are cut, one being banked. No other furnaces have stopped.

PERSONAL.

Thomas W. Williams, Youngstown, Ohio, has been made superintendent of the plant of the Hubbard Co-operative Iron Company, at Hubbard, Ohio. It is stated that, thus far, operation of the above plant has not been as successful as anticipated.

S. H. Harrington, president of the Harrington & King Perforating Company, Chicago, has just returned home from a two months' trip through the

Western mining districts and along the Pacific Coast, taking in the San Francisco exposition.

James H. Carpenter of the Carpenter Steel Company, at Reading, Pa., who has been confined to his home by illness for several months, is again able to attend to business.

Owen's University of Kingston, Ont., has conferred the title of LL.D. on Charles Macdonald, president of the Union Bridge Company.

The World's Fair Buildings.

The Columbian Exposition Salvage Company, with a capital of \$200,000, have purchased the 20 World's Fair buildings, which are all the buildings that the Park Commissioners had in their possession, with exception of La Rabida Convent and the Forestry Building, for the sum of \$80,000. This gives them a working capital of \$120,000 after paying for the buildings. The company consist of the following scrap iron and scrap metal merchants: August Pollak, North Western Iron & Metal Company of Chicago, Ill., A. S. Deutsch & Co. of Chicago and Cleveland, and Ohio Iron & Metal Company of Cleveland, Ohio, and the Chicago House Wrecking Company of Chicago, and Sievers & Fearnly of Cincinnati, Ohio, who are experts in the business of dismantling houses and buildings and also large dealers in the lumber trade. It is expected that work will begin within a few days. The end of this season will see the White City pretty well dismantled. All the structural material will be taken down very carefully, and the company are prepared to sell to railroad companies, factories and others who contemplate erecting buildings any quantity of such material in the iron and lumber structural line that they desire.

Operations at the new tin plate works of Meurer Bros. Company, Flushing avenue, Brooklyn, are proceeding with abundant success. Six pots are now installed and in regular work, turning out an average of 1700 boxes of tin and terne plates weekly. Three more pots are to be added within a short time. Messrs. Meurer have succeeded in producing coke tins and roofing plates of a quality that compares exceedingly favorably with imported material of a similar grade, and their product has been so favorably received by the trade that their orders exceed the present capacity of production. As yet the works have only been running during the day, but a night shift will shortly be put on, thereby doubling the present output. An electric light plant is being installed for this purpose. Four of the tinning machines now in use are of the Thomas & White pattern, two of them being employed on bright and two on terne plates. The other two machines are of the Phillips type and are used for ternes. Each is furnished with a cleaning machine and a dusting machine is provided for every three pots, so that the handling of the plates is carried out with the greatest rapidity. An automatic steam pickling machine is about to be added, as well as a steam shearing machine. In addition to their regular guaranteed plates, Meurer Bros. Company are now making three qualities of ternes, named respectively Grace, Superior and Standard, as well as Brooklyn coke tins and Florence charcoal tins.

The Drop in Pig Iron Production.

Quite a large number of furnaces had been compelled by the scarcity of coke to close down as early as the 1st of this month to which our records refer. The effect is seen in the following summary:

On May 1 the active furnace plant, grouped according to fuel used, possessed the following weekly capacity:

Fuel.		
Anthracite.....	35	17,607
Coke.....	75	88,580
Charcoal.....	17	4,023
Totals May 1.....	127	110,210
Totals April 1.....	144	126,732
Increase or decrease.....	- 17	- 16,522

The weekly product of all the furnaces on April 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
May 1, 18 4.....	127	110,210
April 1.....	144	126,732
March 1.....	133	110,168
February 1.....	125	99,242
January 1.....	130	99,087
December 1, 1893.....	130	99,379
November 1.....	117	80,070
October 1.....	114	73,805
September 1.....	125	89,434
August 1.....	169	107,042
July 1.....	220	153,742
June 1.....	244	174,029
May 1.....	251	181,551
April 1.....	255	178,858
March 1.....	255	178,978
February 1.....	251	171,301
January 1.....	246	173,063
December 1, 1892.....	246	173,271
November 1.....	244	171,082

So far as our telegraphic advices go there have been banked to date since the 1st inst. three furnaces in New York, six in the Pittsburgh district, one in the Shenango Valley, one in Kentucky, four in the Wheeling district and two in the Birmingham district, a total of 17 furnaces, whose capacity was rated in our table at 21,192 tons per week. This reduces the active coke capacity to 67,388 tons at this writing, or the total capacity now at work for all the blast furnaces in the country to 89,018 gross tons. Within the next week, according to the reports received, additional plants representing a tonnage of 3900 tons must stop work. In other words, the districts which on April 1 were producing 73,492 tons of iron weekly were cut down to 47,374 tons on May 1, have been reduced to 28,422 tons on May 9, and will certainly be down to less than 20,000 tons on May 15, a drop of nearly 55,000 tons per week.

The status of the anthracite furnaces was as follows:

Anthracite Furnaces, May 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	18	1	730	17	6,043
New Jersey.....	11	2	1,103	9	3,691
Spiegel.....	3	3	240	0	0
Pennsylvania:					
Lehigh Valley.....	44	11	4,295	33	12,740
Spiegel.....	1	0	0	1	60
Schuylkill Valley.....	27	6	3,870	21	9,350
U. S. Susquehanna Valley.....	14	4	2,363	10	3,182
L. S. Susquehanna Valley.....	16	1	750	15	8,294
Spiegel.....	1	0	0	1	525
Lebanon Valley.....	15	7	4,256	8	2,828
Totals.....	150	35	17,607	115	41,713

For a number of months past our records of active anthracite furnaces show the following:

	Furnaces in blast.	Capacity per week.
May 1, 1894.....	35	17,807
April 1.....	34	17,739
March 1.....	32	16,618
February 1.....	27	13,627
January 1.....	29	13,081
December 1, 1893.....	32	16,188
November 1.....	34	16,166
October 1.....	34	15,338
September 1.....	43	20,758
August 1.....	51	23,572
July 1.....	63	29,268
June 1.....	70	33,916
May 1.....	67	33,168
April 1.....	72	34,641
March 1.....	74	34,773
February 1.....	74	32,371
January 1.....	70	32,772
December 1, 1892.....	69	33,602
November 1.....	69	30,269

Relatively few changes have taken place. Two spiegel furnaces in New Jersey, one Bethlehem in the Lehigh Valley, and Marshall in the Upper Susquehanna Valley, blew in. Work was stopped by Cedar Point, New York. Topton in the Schuylkill Valley, and one Pennsylvania and St. Charles in the Lower Susquehanna Valley.

The condition of the coke furnaces was as follows:

Coke Furnaces, May 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	7	3	3,804	4	2,500
Pennsylvania:					
Pittsburgh District.....	25	18	30,322	7	10,932
Shenango Val.	1	1	960	0	0
Juniata and Conemaugh Valley.....	16	2	1,801	14	13,129
Spiegel.....	16	2	1,074	14	11,770
Youghiogheny Valley.....	1	0	0	1	950
Miscellaneous.	3	1	1,181	2	1,465
Maryland.....	4	1	600	3	1,900
West Virginia.....	5	0	0	5	6,000
Wheeling District.....	1	0	0	1	250
Ohio:					
Mahoning Val.	8	5	6,215	3	2,092
Central and Northern.....	14	0	0	14	12,024
Hocking Val.	11	4	3,469	7	5,359
Hanging Rock	14	1	733	13	3,041
Indiana.....	14	2	559	12	2,893
Illinois.....	2	0	0	2	412
Minnesota.....	19	7	16,263	12	15,612
Wisconsin.....	1	0	0	1	629
Missouri.....	5	2	1,725	3	2,288
Colorado.....	6	0	0	6	3,572
The South:					
Virginia.....	3	1	1,167	2	1,200
Kentucky.....	22	6	3,069	16	9,076
Alabama.....	7	3	1,119	4	1,825
Tennessee.....	38	9	9,237	29	15,065
Georgia.....	14	6	4,625	8	3,020
N. Carolina.....	2	1	757	1	600
	1	0	0	1	97
Totals.....	260	75	88,580	185	127,051

As compared with previous months the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
May 1, 1894.....	75	88,580
April 1.....	72	86,011
March 1.....	83	89,794
February 1.....	80	81,970
January 1.....	80	81,997
December 1, 1893.....	72	78,241
November 1.....	77	85,820
October 1.....	52	58,061
September 1.....	54	56,976
August 1.....	84	77,907
July 1.....	122	117,072
June 1.....	140	132,079
May 1.....	146	139,788
April 1.....	145	135,488
March 1.....	145	133,579
February 1.....	140	129,398
January 1.....	138	131,731
December 1, 1892.....	136	133,160
November 1.....	133	130,673
October 1.....	128	118,595

It will be observed that even as early as May 1 the coke strike told very con-

siderably. We have already stated what the actual situation to date is.

The status of the charcoal furnaces was as follows:

Charcoal Furnaces, May 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	13	0	0	13	1,050
New York.....	5	2	196	3	363
Pennsylvania.....	13	1	60	12	841
Maryland.....	6	0	0	6	425
Virginia.....	13	0	0	13	827
Ohio.....	8	1	69	7	594
Kentucky.....	3	0	0	3	290
Tennessee.....	9	1	100	8	991
Georgia.....	3	1	210	2	230
Alabama.....	13	4	966	9	2,310
Michigan.....	20	5	1,943	15	4,555
Missouri.....	2	0	0	2	597
Wisconsin.....	4	1	337	3	1,760
Texas.....	4	1	137	3	470
Washington.....	1	0	0	1	100
Oregon.....	1	0	0	1	200
Totals.....	118	17	4,023	101	15,603

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
May 1, 1894.....	17	4,023
April 1.....	18	3,992
March 1.....	18	3,754
February 1.....	13	3,645
January 1.....	21	4,099
December 1, 1893.....	26	4,950
November 1.....	26	5,084
October 1.....	28	5,496
September 1.....	28	5,700
August 1.....	34	5,563
July 1.....	35	7,224
June 1.....	34	8,034
May 1.....	38	8,595
April 1.....	38	8,739
March 1.....	36	8,623
February 1.....	37	8,934
January 1.....	38	8,865
December 1, 1892.....	41	9,509
November 1.....	42	9,540

Not one of the New England furnaces is running, although Landon will soon resume. Boiling Springs in Pennsylvania is in, while Isabella went out on the 16th ult. In Ohio Mount Vernon went out in April, but on the other hand Bloom started during the last week in April. In the South Round Mountain is again running.

Stocks.

The position of stocks, sold and unsold, as reported to us May 1, was as follows, the same furnaces being represented as in former months:

	Feb. 1.	Mar. 1.	Apr. 1.	May 1.
Stocks.	Tons.	Tons.	Tons.	Tons.
Anthracite pig	147,112	141,889	141,384	143,041
Coke pig.....	501,269	500,217	500,264	488,978
Charcoal pig.....	203,390	211,945	201,538	211,018
Totals.....	851,771	854,051	843,186	843,037

It must be remembered, as we have frequently stated in connection with these reports of stocks, that they do not include the quantities held by the large steel companies East and West. It is a notorious fact that all of these have heavily reduced their holdings, and that some have cleared their yards entirely and have been forced to buy in the open market.

It is reported that C. H. Domhoff, for many years of Matthew Addy & Co. of Cincinnati, will retire from that firm on June 1.

Philip R. Jennings of Bruce & Cook, New York, sailed for Europe Saturday on the "Lucania." He will be absent about two months, and will combine business with pleasure.

MANUFACTURING.

Iron and Steel.

A charter was issued last week to the Saltsburg Rolling Mill Company of Saltsburg, Pa., with a capital stock of \$100,000. The directors are Samuel A. Gourley, Gilbreth Still, W. W. Leech of Apollo, Pa., Wm. F. Still of Saltsburg, Pa., and Wm. F. Leason of Kittanning. The new concern propose to erect a plant at Saltsburg, on the line of the B. & O. Railroad, some 5 or 6 miles from Pittsburgh, for the manufacture of iron and steel sheets for tinning purposes.

The new 28-inch mill at the Homestead Steel Works, Homestead, Pa., built by Mackintosh, Hemphill & Co., Limited, of Pittsburgh, was put in successful operation last week.

Thomas Furnace of the Thomas Furnace Company, at Niles, Ohio, which has been undergoing extensive repairs since last June, will be put in operation as soon as the coke strike is settled and a supply of fuel is assured. This furnace is one of the most complete in the Mahoning Valley and is expected to turn out about 250 tons of Bessemer pig per day when in operation.

At a meeting of the Board of Directors of the Ohio Steel Company, Youngstown, Ohio, held last week, Wm. H. Baldwin, formerly connected with the Union Iron & Steel Company of Youngstown, was elected secretary.

W. T. Flanders has completed for the Reading Iron Company, Reading, Pa., a new galvanizing plant, which is now in full operation.

The Colorado Fuel & Iron Company have purchased the Robbins mill property, at St. Elmo, Col. The mill is almost new and will require but little expenditure to put it in working order.

Although it has been completed less than one month, the Porter Corrugated Iron Company of Anderson, Ind., report their plant rushed with work. They have a big order for the new Ironclad Rolling Mill, at Middletown. It consists of all the siding and roofing, and will keep the company's entire force busy for a week or ten days. Orders are coming in from all directions.

Two rolling mill projects are interesting the citizens of Anderson, Ind. One of these is a sheet mill to manufacture merchant sheets and black plates for tinning and the other is a rod and wire mill, probably in connection with the wire nail works of the Hazen Company.

The Illinois Steel Company are arranging their works at Joliet so that oil can be substituted for coal. The coal miners' strike has hastened the change, which had been contemplated for some time. The company use very little coal in their rolling mills at Milwaukee, depending mainly on oil.

Articles of incorporation of the Wisconsin Iron & Wire Works of Milwaukee have been filed. The company succeed G. H. Norris in the ownership of the Reliance Works, which Mr. Norris recently bought of D. D. Williams. The capital stock of the new company is \$80,000 and the incorporators are G. H. Norris, J. G. Beckley and J. H. Gilman. Mr. Norris is president, Mr. Beckley vice-president, and Mr. Gilman secretary and treasurer.

A rolling mill is to be built near Davenport, Iowa, and Moline, Ill., by a corporation known as the Sylvan Steel Company, organized with a capital stock of \$250,000. The works will be located on Sylvan Island and will occupy a site of 8 acres. Everything about the plant is to be new and of the most modern character. The product will be special shapes for use in the various works in Moline, Rock Island and Davenport. The stockholders are all capitalists connected with local manufacturing concerns. The principal place of business is in Davenport, Iowa, and the first Board of Directors is composed of S. H. Velie, William Butterworth, T. B. Carson, Nath. French and G. Watson French. The officers are: G. Watson French, president; Nath. French, vice-president; T. B. Carson, secretary and treasurer.

The new malleable iron works at Waukesha, Wis., are being rapidly pushed to completion and the managers hope to have them in operation by June 1. Orders have already been received which will keep the works busy for a considerable time. J. E. Griffin is president, John Klapinski vice president, L. D. Rosenheimer secre-

tary and treasurer, and O. C. Cole superintendent.

The plant of the Paige Tube Company, Warren, Ohio, manufacturers of wrought iron pipe, has been closed down on account of shortage in fuel. This concern have recently issued bonds aggregating \$250,000 for the enlargement of their business, and a trust mortgage for that amount has been executed in favor of Chas. Baird of Akron, Ohio. We are advised that the firm will not take any active steps looking to the enlargement of their business until matters in business have again reached their normal condition.

The Eagle Iron Company, at Spring Valley, Wis., are doing excellent work with their new charcoal furnace. The stack is 13 x 65 feet, and the output has gone up to 64 tons per day with ores averaging but 44 per cent. Although this furnace is located in the district producing Lake Superior charcoal iron, yet the pig iron made here is of a different quality, ranking with Alabama car wheel iron, being smelted from similar brown hematite ore. The company claim to make even a better iron than Alabama car wheel, as it is lower in phosphorus. Their No. 1 iron analyzes about 0.20 in phosphorus, 0.60 in manganese and 1.75 to 2 in silicon. The fuel used is exclusively charcoal, and the ores used are mined in the immediate vicinity of the furnace.

The Mahoning Valley Iron Company of Youngstown, Ohio, recently made a proposition to their plate mill employees to go to work on a large order, if the men would accept a 10 per cent. reduction. At a conference on the matter held last week, it was decided that existing wages would be paid until the convention of the Amalgamated Association, which meets in Cleveland on the 15th inst.

Last week Jones & Laughlins, Limited, of the American Iron & Steel Works, Pittsburgh, contributed \$5000 toward the erection of a hospital on the South Side, Pittsburgh.

It is announced that owing to the heavy decline in prices of bar iron the directors of the Ohio Iron Company, Zanesville, Ohio, have decided to close down their plant indefinitely, and salaried employees are being dispensed with as well as all other classes of labor.

The sale of the property of the Lone Star Iron Company, at Jefferson, Texas, did not take place as advertised, because the highest bid received—\$63,000—lacked \$2000 of being the minimum price authorized to be taken.

Girard Furnace, at Girard, Ohio, has been compelled to bank down owing to the scarcity of fuel.

The Ontario Rolling Mills, at Hamilton, Ont., have closed as the result of the coal and coke strikes in the West, and other large establishments in the province are likely to be similarly affected.

Operations at the pipe mill of the Blandon Rolling Mill Company, Blandon, Pa., have been suspended on account of having no coal.

The new rolling mill of the Baltimore Iron, Steel & Tin Plate Company, at Baltimore, Md., is now in operation, giving employment to 70 additional hands and increasing the weekly output from 1200 to 1800 boxes. It is said to be the purpose of the company to build three additional mills at once, each of which will have a capacity of 600 boxes a week. They will be equipped with the most approved appliances and will cost about \$40,000.

The Dayton Coal & Iron Company, at Dayton, Tenn., have begun the work of relining furnace No. 2, with a view to putting it in blast as soon as practicable.

It is stated that the Southern Iron Company will blow in their furnace at Attalla, Ala., about July 1. This has always been a charcoal furnace, but will blow in on coke.

Bloom Furnace of the Clare Iron Company, Bloom Switch, Ohio, has blown in.

The Stewart Iron Company, Limited, at Sharon, Pa., have just put their furnace in operation.

Vesuvius Furnace, at Pedro, Lawrence County, Ohio, will blow in June 1, under the management of A. J. Duteil.

The work of relining Phoenix Furnace, at Youngstown, Ohio, has been completed, and the furnace will be blown in as soon as a supply of coke can be obtained.

After a two weeks' blast, the furnace of the Claire Furnace Company, Limited, at

Sharpsville, Pa., was obliged to bank down May 1, owing to the scarcity of coke.

Cedar Point Furnace, Witherbees, Sherman & Co., Port Henry, N. Y., has blown out.

Rosena Furnace, at New Castle, Pa., has coked down.

Norton Iron Works, Ashland, Ky., have been forced to bank their fires because of inability to secure a coke supply, and will remain idle until the strike is settled.

The Tipton Furnace Company of Tipton, Pa., have contracted with Philadelphia parties for the sale of their bank of cinder, accumulated during the 20 years' existence of the furnace.

Belmont Furnace of the Wheeling Steel & Iron Company, Wheeling, W. Va., was banked on the 29th ult.

The Oregon Iron & Steel Company of Portland, Ore., are turning out 6 miles of 32-inch cast iron pipe for the city of Portland.

Mabel Furnace, in the Shenango Valley, and Grace, in the Mahoning Valley, have been banked, the former on April 27 and the latter on the succeeding day, owing to the exhaustion of their supply of coke.

Notwithstanding the great inconvenience and the stoppage of many iron and steel plants on account of the coal and coke strikes, the plant of the Junction Iron Company, at Mingo Junction, Ohio, manufacturers of Bessemer pig iron, steel nails and steel tack plate, and also the plant of the Laughlin & Junction Steel Company of the same place, manufacturers of Bessemer steel billets, have been operated right along to full capacity. These two plants are supplied with coke by W. J. Rainey and with coal by the Wheeling & Lake Erie Railroad Coal Company. A slight improvement in demand is noted by the above two concerns, but very little improvement thus far in prices.

The report of H. S. Floyd, auditor in the matter of the voluntary assignment of the Rankin Mfg. Company, Allegheny, Pa., shows the liabilities are \$10,773.09, and assets for distribution \$8555.82. The creditors will receive 81 6-10 per cent.

The strike in the Connellsville coke region is affecting operations to some extent at the plant of the Pennsylvania Steel Company, Steelton, Pa. The supply of Bessemer pig iron is said to be almost exhausted, and on this account the Bessemer department and some of the smaller finishing mills, also the rail and blooming mill, did not resume operations last week until Wednesday evening. Before that every department of the above plant was in operation to full capacity.

For the first time in nine months the Lukens Iron & Steel Company's Works, at Coatesville, Pa., have started up full handed in all departments.

Machinery.

The plant of the Etna Foundry & Machine Company, at Warren, Ohio, will probably be converted into a plant for the manufacture of steel ranges and hot air furnaces.

The Dayton Gas & Gasoline Engine Company have been incorporated at Dayton, Ohio, with a capital stock of \$10,000. The new concern propose to engage in the manufacture and sale of gas and gasoline ranges.

Some months ago Jonathan Creager's Sons of Cincinnati, Ohio, sent several of their automatic brick machines to Russia. So far this year the firm have received several orders from that country, and have recently filled an order from Mexico for two machines.

A new firm have opened an establishment in the machinery center of Chicago. They are styled the Manufacturers' Tool Supply Company, and occupy a storeroom at 17 South Canal street. The officers are Frank Matthiesen, president and treasurer; F. W. Severin, vice-president, and L. B. Shaw, secretary and manager. Mr. Matthiesen was formerly in the purchasing department of the Chicago Sugar Refining Company, and is the son of the president of that company. Mr. Shaw for a number of years has been connected with the Machinists' Supply Company of Chicago, and consequently has had a long experience in the business of selling machinists' tools and supplies. The Manufacturers' Tool Supply Company sell the products of such concerns as the Wiley & Russell Mfg. Company, Waltham Emery Wheel Company, Cleveland Twist Drill Company, Morse Twist Drill Company, Kearney & Foote, and Billings & Spencer.

Lincoln Iron Works, Rutland, Vt., manufacturers of stone working machinery, derricks and hoisting powers, have recently shipped two stone planers, 78 x 46 inches x 12 feet, to Newark, N. J., and will soon send one, 96 x 36 inches x 13 feet, to Scranton, Pa.

At the works of the J. M. Carpenter Tap & Die Company, Pawtucket, R. I., the full time schedule has been resumed and the force increased by 60 hands.

The lower foundry of R. D. Wood & Co., at Millville, N. J., has started up, and the upper foundry is expected to go into operation in a few days.

Jas. T. Mackay, St. Louis, Mo., manufacturer of the Peerless steel flue cleaner, has recently secured some large orders from threshing machine manufacturers and machinery dealers in general.

Bartz & Evans have established a new machine shop at Hornellsville, N. Y.

Geo. Place Machine Company, dealers in new and second hand machinery, with warehouse at 511 and 513 West Thirteenth street, New York, have removed their office from 120 Broadway to 145 Broadway and 86 Liberty street.

The New Era Iron Works Company of Dayton, Ohio, have been incorporated, with a capital of \$50,000, for the purpose of doing general foundry and machine work and manufacturing gas engines. The incorporators are: J. R. Johnston, L. M. Johnston, V. P. Van Horne, A. M. Sullivan and Clara E. Van Horne.

The Lincoln Foundry & Machine Company, now erecting a foundry and machine shops at Pittsburgh, have placed an order with the Industrial Works of Bay City, Mich., for a 20-ton electric traveling crane. This crane will have a span of 48 feet 7 inches and will be of the most approved type.

The Pennsylvania Machine Company have purchased from the heirs of James W. Pike, late of Little Falls, N. Y., manufacturer of knitting machinery, the entire contents of his machine shop, and have transferred the same to their warehouse in Philadelphia, where they will dispose of it.

The Henry C. Ayer & Gleason Company of Second and Diamond streets, Philadelphia, are calling the attention of the trade to their portable cylinder boring machines, which will bore cylinders having one or both heads off, in either vertical, horizontal or inclined positions, without removal from the engine, pump or other article on which it is used. It is only necessary to take off the cylinder head and remove the piston to allow of an accurate and rapid boring being made. The company are also pushing sales of their boring bars for lathes, which bars, they claim, are all accurately ground to gauge and well finished.

The Adams Boiler Company, Cleveland, Ohio, manufacturers of water tube boilers, have just shipped to the Witte Water Placer Company, Paramaribo-Surinam, Dutch Guiana, South America, one of their upright water tube boilers of 125 horse-power, to be inclosed in sectional iron jacket to run Worthington pumps at their gold placer mine. The boiler was manufactured by the Enterprise Boiler Company, Youngstown, Ohio.

We are advised that the statement that the Westinghouse Air Brake Company of Pittsburgh, with works at Wilmerding, Pa., would discharge on May 1 all employees not living at Wilmerding is without foundation. In common with other industries, the Westinghouse Air Brake Company are not as well supplied with work as desired, but the present arrangement under which the works are being operated is fairly satisfactory to all concerned, and no change is contemplated unless there should be some further change in the volume of business.

At Harrisburg, Pa., a charter has been issued to the Pedrick & Ayer Company, Philadelphia, capital \$100,000. The directors are Samuel W. Pedrick, Philadelphia, and Eugene L. Maxwell and Charles A. Moore of New York.

Hardware.

The Reliance Wire Works of Milwaukee, Wis., have been bought by G. H. Norris for \$30,000. Mr. Norris was formerly connected with the company as secretary. The plant will, it is said, be operated again in the near future.

The mower and reaper works of the William N. Whitely Company, Muncie, Ind., were destroyed by fire on the 6th inst. The buildings were all one story in height, and of wood, covered with galvanized iron

All the machinery was new and of the latest pattern. Two thousand machines were ready for shipment and over 15,000 were in a partly completed condition. The loss is estimated at \$245,000, with no insurance. The works were insured until a short time ago, but the rate was so high that it was dropped. The greatest loss to Mr. Whitely is in the patterns, which were the work of a lifetime.

The Wisconsin Handle Mfg. Company, Antigo, Wis., will, it is reported, increase their capital by \$10,000 and add machinery for making barrel headings and washboards.

The Climax Fuse Company, Avon, Conn., have shut down for an indefinite time.

During a rain storm on the night of the 3d inst. lightning struck the plant of the Cincinnati Tin & Japan Company, Cincinnati, Ohio, setting fire to the establishment. The loss is estimated at \$150,000, with insurance of \$80,000.

Kieckhefer Bros. & Co., Milwaukee, Wis., will soon enter upon the manufacture of enameled ware, and with this end in view have commenced the erection of a \$150,000 addition to their already extensive plant. They will manufacture enameled ware in all colors and styles. The new department will give employment, it is expected, to some 200 skilled workmen.

George H. Jacobs of Newburg, N. Y., and James T. Hanrahan of Albany have given Miller & Van Winkle, manufacturers of steel springs, 12 to 24 Bridge street, Brooklyn, the exclusive right to make and sell their patent spring support for a term of years.

Anthony & Cushman Tack Company, Taunton, Mass., have recently added several shoe nail machines to their plant, and are now making a full line of shoe finders' goods. Their factory is being run to its full capacity.

The Yale & Towne Mfg. Company, Stamford, Conn., has just given out the contract for the erection of a new brick building to be used as a packing and stock room for the cabinet lock department. The first building for this new department was erected in the fall of 1891, and was supposed to be sufficiently large to provide for the growth of the first two years. It was found necessary, however, during 1892 to provide further room, which was done by an addition which trebled the size of the original building. The unexpectedly rapid development of this branch of the company's business has been such that the present facilities are again overtaxed and the need of further accommodation is imperative. The new building now to be constructed will have a floor area of 60 x 90 feet, and will be entirely devoted to the packing and storage of cabinet and trunk locks. In view of the valuable nature of its contents, it will be of substantial character, with brick walls and practically fire proof construction, and will also be detached from the other building, although connected therewith by a covered passage. As soon as the new building is completed the space in the present building now occupied as a packing room will be utilized for machinery and productive work, thus enabling the number of employees to be considerably increased. At the present time the facilities of the department are overtaxed and it is unable to execute orders as promptly as desirable, although running on full time, with as many employees as can be utilized.

The Buckeye Machine Works are now in course of erection, at Anderson, Ind. The buildings will comprise a foundry, warehouse, sheds, kilns, saw mill and a main factory. The last named building will be 50 x 300 feet with three wings, each 50 x 100 feet. They will manufacture hardware specialties as follows: The Boss two speed ship builders' and carpenters' boring machine, improved Gem post hole auger, the "H. W." door latch, the Lightning drain cleaner, Lumel door vise or clamp, Cloyd flooring clamp, Simmons cattle tie, Simmons horse poke, Horne force pump, Osborne buggy jack, spiral spring buggy wrenches, wagon and carriage specialties, the Kinkead brick machine, turned hatchet, hammer, pick and auger handles, also Lambert gasoline engine, Cloyd excelsior machine, &c.

Miscellaneous.

The annual meeting of the stockholders of the Fuel Gas & Mfg. Company of Pittsburgh was held in that city last week. The following directors were elected: George Westinghouse, president; Lemuel Bannis-

ter, John Caldwell, Robert Pitcairn, H. H. Westinghouse, J. R. McGinley and A. L. McKaig.

The Berlin Iron Bridge Company paid on April 14 their regular quarterly dividend of 1½ per cent.

The Champion Iron Company of Kenton, Ohio, have just finished the shipment of two carloads of fence to the West Penn Hospital, at Pittsburgh. They have also shipped two carloads of structural iron to the Carnegie Library Building in the same city. The Wise County jail in Virginia is also to receive a carload of new jail work.

The stockholders of the Lafayette Bridge Company, at Lafayette, Ind., have voted to increase the capital stock \$25,000, making it \$55,000. Additions are now being made to the plant which will make the main building 50 x 500 feet with a wing 50 x 150 feet. More machinery is also to be installed.

The Columbia Spring Company, manufacturers of wagon and carriage springs, with main offices in the Bank of Commerce Building, Pittsburgh, and works at Hammond, Ind., St. Louis, Canton, Ohio, and White Plains, N. Y., are operating the different plants at the above places night and day, with the single exception of the plant at White Plains, which is running single turn. The concern have a large amount of business on hand and expect to operate their different plants double turn for some time to come.

The shops of the Marietta & North Georgia Railroad Company, at Marietta, Ga., have been burned. An insurance of \$127,000 was carried, which practically covers the loss.

The Elliott Car Company are now at work removing the car wheel foundry of the Bluffton Car Wheel Works from Bluffton to Gadsden, Ala. The addition to the works at the latter place will be one building 75 x 200 feet.

Seventeen headers in the nut and bolt department of the Indiana Iron Works, Muncie, Ind., struck because an increase in wages was denied them. The strike is liable to lead to the closing down of the entire plant.

The affairs of the Fostoria, Ohio, Brass & Iron Works, which failed about a year ago for over \$200,000, have been practically settled, the creditors agreeing to accept 50 cents on the dollar for their claims in first mortgage bonds.

The large brick structure of the York Safe & Lock Company, at York, Pa., has been totally destroyed by fire, entailing a loss of about \$60,000. The works were built in 1882 and had always been in full operation, employing about 100 men. They will be rebuilt as soon as possible.

Articles consolidating the Ahrens-Ott Mfg. Company and the Southwestern Iron Works have been filed at Louisville, Ky. The two concerns are practically owned by the same parties, and the consolidated corporation will hereafter be known as the Ahrens-Ott Mfg. Company. The capital stock is \$400,000.

At a special meeting of the stockholders of the Equitable Natural Gas Company, held in Pittsburgh last week, it was decided to increase the indebtedness of the company \$500,000 for the purpose of making extensive improvements.

The annual meeting of the stockholders of the Philadelphia Natural Gas Company will be held in Pittsburgh at noon on Monday, May 7. During the past year this concern disbursed \$450,000 in dividends, against \$243,000 the preceding year. It is reported that \$100,000 was added to the surplus account, against \$423,000 in 1892.

The plan of Ex-Secretary of the Treasury Foster to adjust the indebtedness of the Fostoria Brass & Iron Company, Fostoria, Ohio, by issuing bonds to the amount of 50 cents on the dollar has been consummated, the creditors having agreed to take 50 per cent. of their claims. It is stated that the chances for a favorable settlement of all of the indebtedness of Mr. Foster are very favorable.

Owing to the falling off in orders the Keystone Bridge Works of Pittsburgh have recently laid off temporarily a large number of employees.

A meeting of the directors of the Steel Dash & Fender Company of Lockport, N. Y., will soon be held to consider the matter of removing their plant to Niagara Falls, N. Y. It is understood that plans and specifications for a building to be erected are soon to be given out for

bids. The new structure is to be conveniently located near two railroads. The plant will probably be removed from Lockport after the spring trade is ended. The company are now making from 150 to 200 dashes a day.

The Berlin Iron Bridge Company of East Berlin, Conn., are putting up a new transfer station for the Washington & Georgetown Railroad Company at Washington, D. C. The same company are putting up an iron and steel building seven stories high for James Pettit of New York City.

The Buffalo & Susquehanna Railroad Company are shortly to erect new shops at Austin, Pa. The machine shop will be 100 x 100 feet, the car shops 250 x 50 feet, and the carpenter shop 135 x 50 feet.

The latest report in regard to the removal of the Bath Iron Works to New London, Conn., is that the result hinges on Congressional action. Should the Fithian free ship bill become a law no change in location will be made.

The New Haven Rolling Mill, New Haven, Conn., has shut down for an indefinite period. The mill employs about 150 men in ordinary times.

The A. French Spring Company of Pittsburgh, manufacturers of elliptic and spiral springs of all descriptions, advise us that the report that they had recently put on an increased force of men is without foundation. The firm further state that as yet they have not been able to notice any improvement in trade, but are hopeful of the future.

The Girard Stove & Foundry Company, Girard, Ohio, contemplate making some improvements at their plant, and will probably build a new foundry at an early date. The statement that this concern were considering the advisability of removing their works to another city is denied.

A. T. Paige has resigned his position as treasurer and general manager of the Paige Tube Company, manufacturers of wrought iron pipe, at Warren, Ohio. E. B. McCrum, Jr., succeeded Mr. Paige, and Thomas J. Bray was made secretary in addition to holding the office of superintendent. The plant of the Paige Tube Company is in full operation, with sufficient orders ahead to insure operations on that basis for some time to come.

A recent visit to Beaver Falls, Pa., showed that the various industrial establishments at that place and immediate vicinity are much better employed at this time than they were during the latter part of last year and early this year. The plant of the H. M. Myers Company, manufacturers of shovels, spades and scoops, is in operation, but not to full capacity. The works of the American Axe & Tool Company are being operated double turn in all departments, and have plenty of orders on hand. Emerson, Smith & Co., saw manufacturers, have been running single turn for some time. The plant of the Keystone Driller Company, manufacturers of portable boilers and oil well supplies, is in operation on single turn. The Beaver Falls Mills of the Carnegie Steel Company, Limited, are in operation to full capacity, the product being wire nails exclusively. W. P. Townsend & Co., New Brighton, Pa., manufacturers of rivets, are in operation to nearly full capacity. The Penn Bridge Company of Beaver Falls, Pa., contractors and manufacturers of bridges and structural material in iron or steel, are in full operation, with considerable work on hand. This concern recently took the contract for the erection of five small bridges in Allegheny County, Pa.

Norton Brothers of Chicago are negotiating for the purchase of a part of the output of the Ellwood Tin Plate Company, Ellwood City, Pa. The plant of this concern was recently put in operation and will manufacture black sheets for tinning purposes. The concern have a four-mill plant and will give employment to about 100 men when in full operation.

The labor troubles at the plant of Baackes & Co., Cleveland, Ohio, manufacturers of wire rods, wire nails, plain and barbed wire, have been satisfactorily adjusted, and operations were resumed on Monday morning, the 7th inst., in all departments on double turn.

Hiogo, Japan, will hold a World's Fair next year.

The Iron and Metal Trades.

The situation is very much mixed, the growing scarcity of Coal and Coke interfering very considerably with operations. Production of Pig Iron was 16,522 tons less weekly on May 1 than it was on April 1; and since then we have advices that 17 other furnaces, representing a tonnage weekly of 21,192 tons, have stopped. Further additions to the list are known to be sure during the next week. The resulting scarcity of Bessemer Pig has driven the market upward to \$12, Pittsburgh, transactions having been closed for upward of 30,000 tons, including one block of 13,000 sold by a Cleveland interest to a Pittsburgh concern. Even then the demand has not been filled.

Soft Steel is also scarce, for spot delivery, but the imperative requirements are not very large at the prices at which it is held. The Chicago district in the West and the Eastern mills at the other end of the line appear able to supply their markets quite readily.

If the strike should continue and establish a permanently higher range of values, which many are confident of, then the pressure of Pittsburgh, Wheeling and the Valleys in Eastern and Western markets will be much relaxed. The advance in freight rates from the Pittsburgh district east and west will aid in the same direction.

So far as the rolling mills are concerned they are able to worry along much better than the furnaces. Natural gas in some sections and oil in others is enabling them to make pretty good time thus far. The result is that in spite of the rise in raw material Finished Iron and Steel has moved but little. The feeling is a little firmer, but no real advance except for immediate requirements has been established. It seems reasonable to expect some improvement to correspond with the higher cost.

Buyers do not frighten easily after so long a period of declining prices, but it is pretty certain that they are "skating on thin ice." There is a feeling of uneasiness even now over the situation in the Lake Superior Ore mines. The troubles on the Mesaba range are looked upon as a forerunner of a general restoration to higher wages. Of course, there is plenty of Ore in the lower markets, but any prolonged idleness during the shipping season might become very troublesome.

It is an astonishing fact, but it remains a fact, that there are signs of weakness in some sections in the market for Foundry Irons.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., May 8, 1894.

The Iron and Steel trade is in a very chaotic condition owing to the condition of affairs in the coal and coke regions. Prices of Steel are dearer, but that this would be the case in the absence of a strike is extremely doubtful. In other words, the trade hardly know where they stand. Better prices can be had for guaranteed deliveries of almost anything, but with fuel supplies nearly exhausted guarantees of that kind cannot be given, except to a very limited extent. On the other hand, if there should be an early settlement of the strike, there is little doubt that prices would react, although it is not likely that they would reach the low figures recently ruling. It is a difficult problem anyway, and a general readjustment will be necessary before business gets into its normal condition. The chances, however, appear to be in favor of gradually hardening prices, as the volume of business is increasing and in time must have its effect, although as we said before a readjustment will have to be made before there can be any very decided movement either way. Iron seems to move in an orbit of its own, prices if anything being lower than they were a week ago, with no present indications of stiffening. The outlook in regard to the tariff seems to be more favorable, and after making all allowances, it is believed that the business situation is gradually shaping for improvement.

Pig Iron.—The market is not in a satisfactory condition, although the volume of business is maintained, and the supply not excessive, although ample for all demands. Prices are very irregular and on the whole a shade lower than they were a week ago, but it is almost an impossibility to give exact quotations. There may be a price for one brand which may or may not be up to the mark in quality, and forthwith some other brand (possibly of a better quality) meets the price or more than meets it, and so it goes from day to day, and of late it has all been in the direction of lower prices. With such a shortage of fuel and so many furnaces banked or preparing to bank, it is astonishing how prices are being slaughtered, but it is a fact all the same. The entire demand seems to be for No. 2 X, or No. 2 Plain, the former being quoted all the way from \$11.25 to \$12, with the bulk of the business at \$11.35 @ \$11.50, but all depends on what the Iron may be, how much is taken, and at what point it has to be delivered. Plain No. 2 and lower grades are nominally \$10.50 @ \$10.75, but the right kind of a buyer can come pretty close to \$10.25, although the supply of that grade is not excessive. Bessemer is at a high premium, and would cost \$12.50 @ \$13 from the West, but it is doubtful if it could be had in quantity, as holders are afraid to part with stocks until they see some chance of replacing them. A sale of 1500 tons from an Eastern furnace was made a day or two ago at a price equal to about \$12, at furnace, but it included some misfit stock, which until recently was hardly salable at any price. General quotations for Philadelphia and equivalent points are about as follows:

Bessemer.....	\$12.50 @	\$13.00
Standard No. 1 Foundry X.....	12.50 @	12.75
Standard No. 2 Foundry X.....	11.25 @	11.75
No. 2 Plain.....	10.75 @	11.00
No. 1 Soft.....	11.50 @	11.75
No. 2 Soft.....	10.75 @	11.00
Standard Gray Forge.....	10.10 @	10.75
Ordinary.....	10.25 @	10.50

Steel Billets.—Sellers quote \$18.75, delivered, but there is no demand at that figure, and although there is a chance that odd lots could be picked up at perhaps half a dollar less money, bids are hard to secure. One reason is that fuel is getting scarce, and consumers might not be able to use Billets if they got them, and the next reason is that if fuel becomes plentiful Billets ought to be lower, so that between the two there is no great disposition either to buy or sell until the coal and coke question is settled.

Finished Material.—There is a good demand for small and medium sized lots, and mills in this vicinity are still gradually increasing their output. A portion of this is no doubt due to the difficulty in securing deliveries from the West, but apart from that the situation is improving. Orders during the past week have been somewhat larger than the week's deliveries, while the current demand promises well for the next 30 or 60 days. Large orders are still conspicuously absent, ship building, locomotive building and work of that kind being extremely dull, although deliveries on contracts made early in 1893 help some of the larger mills considerably. Skelp has been sold somewhat more largely, however, and apart from the larger industries business seems to be improving slowly, but there is a perceptible improvement nevertheless. Prices, too, average better than at any time since the beginning of the year, and from present appearances this feature is likely to be maintained. Small lots are quoted about as follows, large lots subject to concessions, but not as important as they were some time ago:

Grooved Skelp, delivered.....	1.20¢ @	1.25¢
Standard Refined Bars.....	1.30¢ @	1.40¢
Medium quality.....	1.15¢ @	1.20¢
Tank Steel.....	1.25¢ @	1.35¢
Heavy Plates.....	1.30¢ @	1.40¢
Shell.....	1.40¢ @	1.50¢
Flange.....	1.60¢ @	1.80¢
Angles.....	1.20¢ @	1.30¢
Beams and Channels.....	1.40¢ @	1.60¢

Old Material.—There is a better feeling in this department, and if mills could get their usual supply of fuel prices would probably be better. Fears of a shortage in fuel, and in some cases an actual scarcity, have caused consumers to ask for a postponement of shipments, but nevertheless prices are steady at about the following quotations:

Heavy Melting Steel.....	\$10.00 @	\$11.00
Light Melting Steel.....	8.00 @	9.00
No. 1 Wrought Scrap.....	10.00 @	11.00
Machinery Cast.....	9.50 @	10.00
Wrought Turnings.....	8.00 @	8.50
Cast Borings.....	6.00 @	6.50
Old Iron Rails.....	12.00 @	12.50

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, May 9, 1894.

Trade in Pig Iron continues to be greatly restricted. Many of the furnaces are accepting no orders for forward delivery, but there is no great demand, so that prices are not much better than nominal. There has been a fair business in a small way for current consumption in this district and in the East, the orders being from one to three carloads, mainly for Coke Foundry, but with a fair sprinkle of Charcoal Iron; and although the orders are individually small, they make a considerable aggregate. There are rumors of lower prices being accepted, but they cannot be traced to authentic

sources, and it is not probable that the furnaces would make lower prices until they are assured of a more adequate fuel supply; if they would, then consumers of Pig Iron are disposed to go slow until the question of fuel is settled. But they must have some Iron, and as a rule, have to pay pretty full prices for it. Quotations are unchanged, but are scarcely more than nominal, as follows:

Foundry.

Southern Coke, No. 1.....	\$10.25 @ \$10.50
Southern Coke, No. 2.....	9.25 @ 9.50
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1.....	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2.....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.50 @ 13.00
Lake Superior Coke, No. 2.....	11.50 @ 12.00
Hanging Rock Charcoal, No. 1.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 2.....	16.50 @ 17.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.....	16.25 @ 16.75

Forge.

Gray Forge.....	8.50 @ 8.75
Mottled Coke.....	8.25 @ 8.50

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, May 9, 1894.

The threatened interference with business on account of the Coal strike is not developing as rapidly as had been anticipated. There is no doubt a shortage of Coal in many localities through the West and prices of Soft Coal have advanced sharply in this city, but so far the effect on the Iron trade has been slight. A little stiffening in prices is manifest in some branches, but the advance thus far made is not very important. It will take another week or two of the strike to create really serious consequences. Meanwhile the announcement is made that the huge stocks of Coal at West Superior will be drawn upon for the lower lake cities, which may put them in comfortable position for some time.

Pig Iron.—A little improvement is noted in the sales of local Coke Iron and the inquiry has notably increased. Consumers are not disposed to purchase larger lots than heretofore. But they are inclined to purchase oftener. Sales of Southern Iron are confined to small lots in the same way, but an occasional buyer is making inquiries on round lots. At least one conspicuous Southern brand is now out of the market on account of the scarcity of furnace fuel in the South, and others are expected to be withdrawn very shortly if the strike does not speedily come to an end. The foundrymen in this vicinity are beginning to run short of Coke, and some of them have already reduced their output of castings. This will restrict the demand for Pig Iron if it assumes any large proportions. The Foundry Coke dealers hope to be able to secure enough Coke from districts unaffected by the strike to keep the foundry trade supplied. The demand for Lake Superior Charcoal is light. One of the leading producers of this class of Iron reports that April was the month of smallest trade he had for several years. The demand is very rarely for larger than carload lots and prices are well maintained on such quantities. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$15.00 @ \$15.50
Local Coke Foundry, No. 1.....	11.25 @ 11.50
Local Coke Foundry, No. 2.....	10.50 @ 11.00
Local Coke Foundry, No. 3.....	10.00 @ 10.50
Local Scotch.....	11.50 @ 11.75
Ohio Strong Softeners No. 1.....	12.00 @ 13.50
Southern Silvery, No. 1.....	..... @ 11.50

Southern Silvery, No. 2.....	..... @ 11.00
Southern Coke, No. 2.....	10.00 @ 10.35
Southern Coke, No. 3.....	9.75 @ 10.00
Southern, No. 1, Soft.....	10.25 @ 10.50
Southern, No. 2, Soft.....	9.75 @ 10.00
Tennessee Charcoal, No. 1.....	15.00 @ 15.50
Tennessee Charcoal, No. 2.....	14.50 @ 15.00
Alabama Car Wheel.....	17.35 @ 18.00
Jackson County Silvery.....	15.00 @ 16.00
Other Ohio Silvery.....	12.50 @ 13.00
Coke Bessemer.....	12.00 @

Bars.—The market was sluggish most of the past week and makers who asked an advance made no sales, but on Monday and Tuesday a nervous feeling developed among buyers and sales were made at 1.10¢, Chicago, for Common Iron. Good inquiries are at hand. Soft Steel Bars are very firm at about 1.25¢ for Billet stock. Jobbers report a light demand from store and continue quotations at 1.20¢ upward for Bar Iron and 1.30¢ upward for Soft Steel Bars, according to quantity.

Structural Material.—A little better inquiry is coming from bridge works in this territory. The demand for Beams and other Building Shapes in the city is still small. Country trade in Building Material continues good, but for small lots only. Quotations on mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.35¢ @ 1.40¢; Tees, 1.50¢ @ 1.60¢; Angles, 1.30¢ @ 1.40¢; Universal Plates, 1.30¢ @ 1.35¢. Small lots of Beams from stock are selling at 1.50¢ @ 1.60¢ @ 100 lb.

Plates.—Mill agents report a number of fair inquiries, mainly from bridge works. The new elevated railway projects have for some time been expected to come into the market for material, but for some reason matters have not yet progressed to that stage. When these contracts come up they will call for a very great deal of bridge work. Mill shipments, Chicago delivery, may be quoted as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.60¢ @ 2.10¢; Fire Box, 2¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.60¢ @ 1.85¢; Flange Steel, 2.10¢ @ 2.35¢; Boiler Tubes, 75 ¢ off.

Sheets.—More mills are reported sold up to July 1 on both Black and Galvanized Sheets and are not now quoting prices. The business of the summer is being concentrated into very much less time than usual, and the prospects indicate that the works will be very well employed at least to July 1, when labor troubles are generally expected. A typographical error was made last week in quotations of mill shipments of No. 27 Common Stove Pipe Iron. Prices should read for Chicago delivery 2.35¢ @ 2.40¢. Galvanized Iron is considerably firmer, and mill shipments may be quoted steady at 77½ % discount for Chicago delivery. Sheet Copper is unchanged at 14¢ base, with no discount.

Merchant Steel.—The demand is light, but this is usual at this season of the year, as it is too early for large consumers to place their season contracts. Some business is doing in carload lots, but they are not numerous. We quote mill shipments, Chicago delivery: Smooth Finished Machinery and Tire, 1.70¢ @ 1.80¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.55¢ @ 1.60¢; Bessemer Tire, 1.40¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Billets and Rods.—Sales are reported amounting to 2500 tons of Billets for June delivery. Quotations are now \$18 @ \$18.50, according to specifica-

tions. A great deal of inquiry has recently come up for deliveries through the balance of the year, but makers are not disposed to sell beyond June. The Wire Rod market is unsettled at present, but manufacturers decline to make quotations until actual business comes up to test values. One of the mills in this vicinity is now in shape to take some additional business for early delivery.

Rails and Track Supplies.—Manufacturers report the Steel Rail trade looking better than for many months. A number of nice orders were booked last week, and the prospects are excellent for a continued trade. The new projects which have been on the carpet for some time are taking shape very satisfactorily. Quotations are: \$25 @ \$27 for standard sections of Steel Rails; 1.25¢ @ 1.40¢ for Steel Splice Bars; 2.20¢ @ 2.30¢ for Track Bolts with Hexagon Nuts, and 1.70¢ @ 1.80¢ for Spikes.

Old Rails and Wheels.—The only transaction which has come to light during the week was a sale of 500 tons of Old Iron Rails, to be delivered outside of this territory. The railways here are weakening in their views as to value of Old Rails on hand, and some are soliciting offers from dealers and consumers. Quotations are nominally about \$10. Short lengths of Old Steel Rails are quotable at \$6.50 @ \$7, and long lengths \$9.50 @ \$10. No demand exists at present for Old Car Wheels, which are nominally quoted at \$10 @ \$10.50.

Scrap.—Nothing has occurred in this line worthy of notice. Dealers quote the following selling prices per net ton: Railroad Forge, \$9; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$6.50; Pipes and Flues, \$6; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Fish Plates, \$10; Horseshoes, \$9; Mixed Steel, gross ton, \$5.

Metals.—Carload lots of Lake Copper stand at 10¢, and casting brads at 9½¢. Spelter is quoted at 3.30¢, with very little doing. Lead is also quoted at 3.30¢, with very little business.

The Cambridge Iron & Steel Company have discontinued their Chicago office in The Rookery, where they were represented by George G. Spencer. All correspondence and business will be attended to direct from Cambridge, Ohio.

J. H. Nott, formerly with Forsythe, Hyde & Co., has engaged in business on his own account as sales agent for the Whitman & Barnes Mfg. Company's twist drills and as a broker in Pig Iron and Spelter, with an office in suite 77 Commercial National Bank Building, 175 Dearborn street, Chicago.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
ST. LOUIS, May 9, 1894.

The Coal strike is beginning to make itself felt in this city. Many concerns have only from ten days' to two weeks' supply of coal on hand, and are unable to obtain additional supplies except at greatly advanced prices. Some manufacturers are running on Coke; but as the Coke district is also practically tied up there is little hope in this direction.

About the only Coal obtainable to-day is Pittsburgh, which is stored in large quantities at Cairo, Ill., the owners of which, in addition to supplying many large manufacturers, are selling to Coal operators whose mines are closed down. The indications are that many concerns will be compelled to close down. This applies more particularly to the larger concerns, who usually do not carry more than two weeks' supply on hand.

Pig Iron.—The situation is not materially changed. The strike in the Southern district has had the effect of making prices a trifle firmer; not that they have advanced, but rather the exceedingly low prices which have been disturbing factors in the market are now withdrawn. The scarcity of Coal is also having a beneficial effect, and it is pretty generally agreed that should the Coal strike continue through the month of May at least 50¢ per ton will be added to the selling price of Iron. Sales during the week have been fairly good. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	\$10.75 @ \$11.00
Southern Coke, No. 2 Foundry	9.75 @ 10.00
Southern Coke, No. 3 Foundry	9.50 @ 9.75
Southern Gray Forge	9.00 @ 9.25
Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Bar Iron.—Mills report a better demand and prices are inclined to be a trifle firmer. The Coal famine has caused mills to withdraw some of the low prices offered, so that the market can now be said to be in much better condition. Jobbers report an improved demand at 1.25¢ @ 1.30¢. Mills quote 1¢ @ 1.05¢ for carload lots.

Barb Wire.—The demand continues to fall off and prices show no signs of early improvement. Painted is quoted at \$1.75 @ \$1.80 in carload lots from mill. Galvanized commands the usual 40¢ per hundredweight advance.

Wire Nails.—This department is in much the same condition as Barb Wire. The demand is slow and prices are unchanged. Mills quote \$1 @ \$1.05 in carload lots, f.o.b. cars East St. Louis. Jobbers ask \$1.10 @ \$1.20.

Rails and Track Supplies.—Outside of an occasional sale of Steel Rails there is nothing interesting to report. Late last week a sale of 12,500 tons of 60-lb Rails was made by a local concern to a Southern road for immediate use. These Rails were sold on the basis of \$25, f.o.b. Chicago. Track Supplies are dull and prices unchanged as follows: Splice Bars, 1.30¢ @ 1.35¢; Spikes, 1.70¢ @ 1.75¢; Bolts, Square Nuts, 2¢ @ 2.05¢; with Hexagon Nuts, 2.10¢ @ 2.15¢; Steel Links and Pins, 1.60¢ @ 1.65¢; Iron, 1.75¢; Old Rails are quoted at \$10, while Steel Rails are \$26 @ \$27.

Pig Lead.—The market is quite active and sales of several hundred tons have been closed at from 3.17½¢ to 3.20¢. The market closes strong at 3.20¢, with the possibility of a still further advance.

Spelter.—At 3.30¢ this metal seems to be anchored. It is now generally conceded that stocks are lighter than ever, and a large order would quickly send prices upward. Purchasers are satisfied to provide for their immediate wants, and are not disposed to anticipate longer than 30 days ahead.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, Pittsburgh, May 8, 1894.

The conference of Coal operators and miners to be held in Cleveland on Tuesday, the 15th inst., is being awaited with much interest. By many it is believed that a settlement of the Coal strike will be effected by the men being granted an advance in wages. The situation in the Connellsville region does not improve and only a minimum amount of Coke is being made. As yet few mills in the Pittsburgh district have been compelled to close on account of the Coal strike, but a number of concerns are close to the end of their supply and will be compelled to close in a few days unless they can obtain more fuel. The blast furnaces are seriously affected by the Coke strike and many have banked up. Pig Iron and Billets for prompt shipment can hardly be had, \$12 for the former and \$17.50 for the latter having been paid this week. Quotations on many lines of Finished Material have been withdrawn and higher prices are asked. The volume of business is exceedingly light, buyers taking only such material as their necessities demand.

Pig Iron.—The event of the week was the purchase of some 13,000 tons of Bessemer Pig for prompt delivery by the Carnegie interest from M. A. Hanna & Co. of Cleveland. The Iron is piled in the yards of Rosena Furnace, in the Shenango Valley, and will be shipped to Bessemer as soon as possible. The price is said to have been \$11.25 at furnace, equal to \$11.85 delivered, but some claim that a higher price was paid. The Coke strike is playing havoc with the furnaces, more than half the number in the Pittsburgh district being closed. The two Carries were banked on April 29. Clinton is going and has considerable Coke piled. Of the nine Edgar Thomson stacks, two are banked, and more will likely be banked this week. The two Lucy stacks are also banked, and Edith was blown out last month for repairs. Of the three Eliza stacks, one is banked and another will bank in a day or two. Two Isabella stacks are off and the other may bank in a few days. The two Monongahela stacks are off, one being banked and the other blown out for a new lining. The two Shoenberger stacks are banked, and Soho has been idle for two or three years. In the Mahoning Valley all the stacks are off, and the same is true of the Shenango Valley, with the single exception of Stewart. The Cleveland district is idle. For prompt Bessemer \$12 @ \$12.50 is asked and very little can be had at that price. It is the impression that even with a settlement of the Coke strike prices of Bessemer Pig will not materially decline, as many of the furnaces are sold ahead for two or three months, and the available supply is bound to be limited for some time. Owing to the light demand for Gray Forge and Foundry Iron, prices have shown very little improvement. For spot deliveries of Pig Iron we quote as follows:

Neutral Gray Forge	\$8.40 @ \$9.50, cash.
All-Ore Mill	9.50 @ 9.75 "
No. 1 Foundry	11.00 @ 11.25 "
No. 2 Foundry	10.25 @ 10.50 "
No. 3 Foundry	9.75 @ 10.00 "
Bessemer	12.00 @ 12.50 "

We note a sale of 200 tons of Bessemer at \$12.10, delivered, and 500 tons of Gray Forge at \$9.40, delivered.

Ferromanganese.—We quote at \$58, delivered at buyer's mill, for 80 % domestic.

Billets.—Steel for prompt delivery is exceedingly difficult to obtain, and a sale of 100 tons for spot delivery was made yesterday at \$17.50 at maker's mill. Naturally the demand is very light and for immediate requirements only. The Pittsburgh mills have no Steel to offer for prompt delivery, and Wheeling mills are asking \$17 @ \$17.50 at maker's mill. One of the Wheeling plants will close this week unless additional supplies of Bessemer Pig are obtained. Some of the brokers who have a limited amount of May Steel are asking \$18 at mill.

Structural Material.—Last week Pittsburgh took a contract for about 500 tons of Beams for Eastern shipment. The demand is only moderate, with prospects for the future not very encouraging. It is claimed the mills are strictly observing the agreement not to sell below 1.20¢ at mill. We quote Beams and Channels up to 15 inches, 1.20¢ @ 1.30¢; Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.25¢ @ 1.35¢.

Plates.—Prices continue to show a firmer tendency and some mills that expect to close within a few days are refusing to quote as low as 1.15¢ at mill for Tank Plate. Buyers are pushing the mills for prompt shipments, fearing a delay in getting material in the event of the Coal strike being prolonged. We quote as follows: Tank Steel, 1.15¢ @ 1.25¢; Flange, 1.40¢ @ 1.45¢; Shell, 1.30¢ @ 1.35¢; Marine, 1.50¢ @ 1.60¢; Fire Box, 1.75¢ @ 4¢, as to quality.

Bars.—Prices have stiffened up considerably during the past few days and some very low quotations have been withdrawn. Mills are now asking from \$2 to \$3 per ton advance on former quotations. There is a fair demand from small consumers, who are insisting on prompt shipments. We quote Common Iron Bars at 1.05¢ @ 1.15¢ at mill, with the usual extras. Steel Bars of best grades are quoted at 1.15¢ @ 1.25¢ at mill, with Bar Iron extras.

Sheets.—Trade in Black Sheets is active, and prices are showing a firmer tendency, due to the Coal strike and the advance in Steel. We quote Soft Steel Sheets in ordinary lots as follows: No. 24, 2.15¢; No. 26, 2.25¢; No. 27, 2.35¢. Galvanized Iron is in active demand, with discounts ruling at 75 and 10 % for good sized orders.

Merchant Steel.—Mills report a fair run of orders, with prices showing a firmer tendency on account of the Coal strike. A local concern turned down an order for Tire Steel a day or two ago at a price that would have been accepted two weeks ago. The Open Hearth plant of the Linden Steel Company, idle since last summer, has been put in partial operation. We repeat quotations of last week, as follows: Bessemer Machinery, 1.30¢ @ 1.35¢; Open Hearth Machinery, 1.50¢ @ 1.60¢; Open Hearth Spring, 1.70¢ @ 1.75¢; Toe Calk, 1.80¢ @ 1.85¢; Machine Straightened Tire, standard quality, 1.60¢ @ 1.65¢; Cold Drawn Steel Shafting, 2.57½¢ base; Tool Steel, 5¢ @ 7¢ for ordinary grades.

Muck Bars.—We quote nominally at \$18.50 @ \$19, delivered at buyer's mill, for best grades.

Skelp Iron and Steel.—The tendency to higher prices for close delivery in both Iron and Steel Skelp, referred to last week, continues, and for prompt shipments we quote as follows: Grooved

Steel Skelp, 1.10¢ @ 1.15¢; Sheared Steel Skelp, 1.20¢ @ 1.25¢; Grooved Iron Skelp, 1.25¢ @ 1.30¢; Sheared Iron Skelp, 1.35¢ @ 1.40¢.

Wire Rods.—In the absence of transactions we omit quotation. The sharp advance in Steel for prompt shipment is expected to lead to higher prices for Rods.

Wire Nails.—A number of mills have withdrawn some recent quotations and for prompt delivery we quote Wire Nails at \$1 @ \$1.05 at mill in carload lots. Cut Nails for close delivery may be quoted at 90¢ for usual averages.

Barb Wire.—For prompt delivery mills are asking from \$1 to \$2 per ton advance over former quotations. We quote Four-Point Galvanized at \$2.15 for May delivery in carload lots. Plain Wire is held at \$1.40 in carload lots for sharp delivery.

Connellsville Coke.—The Coke strike shows no signs of settlement, and while a small quantity of Coke is being turned out, it is claimed the operation of the ovens under present conditions is very unsatisfactory, and the quality of the Coke is not up to the usual standard. It is stated that one operator, who has been able to turn out a limited supply of Coke right along, has been getting from \$2.50 to \$3 per ton for it.

(By Telegraph.)

The committee appointed by Secretary of the Navy Herbert to inquire into the charges made against the Carnegie Steel Company, Ltd., of furnishing the Government with defective Armor Plates, arrived in Pittsburgh on Tuesday morning. The committee is holding its sessions in the Government Inspector's Office at the Homestead Steel Works and the proceedings will be kept secret. After the evidence has all been taken the committee will make its report to Secretary Herbert. The fact that the investigation is being conducted secretly is causing adverse comment, the general opinion being that the sessions should be open to the public.

Freight rates on manufactured articles of Iron and Steel, Pig Iron and Billets to points east and west of Pittsburgh will be advanced on June 15 to the same basis in force before the last reduction. The present rate from Pittsburgh to Chicago is 11¢ in carload lots and 15¢ in less than carload lots. This will be increased to 15¢ in carload lots and 17½¢ in less than carloads. Billets from Pittsburgh to Philadelphia, now \$1.70 per ton, will be increased to \$2.30. Rates to other points east and west will be advanced in proportion.

Financial.

In general, the financial situation differs little from that outlined in our report of last week. The influx of gold has continued to the full extent anticipated. During the week ending on Wednesday \$5,600,000 have been shipped abroad, bringing the net exports of the metal for the present year up to \$18,895,000. In all \$3,100,000 have been arranged for this week, \$1,900,000 to go to-morrow. That the present outward movement will continue for a time is probable, but that it is likely to assume extended

proportions is not generally expected. These shipments are regarded as the natural result of commercial laws and of special and transient conditions. The trade balance in favor of this country is, however, so large that sooner or later Europe will have to liquidate the debt by a return of gold. Consequently the present outflow of the metal, although heavy, is not exciting any particular uneasiness in the financial world. Its effect on the Stock Exchange has been practically nil, as evidenced by the continued strength of the market for shares in face of this and other depressing factors.

Among these latter are the continued decreases shown in reports of railroad earnings, a fair gauge of the business of the country. These do not yet tend toward improvement, except in a limited number of cases, as in Lake Shore and Northwest. These, however, are the exceptions which prove the rule. As a general thing the diminution of decreases exhibited from week to week has been very slight. The *Financial Chronicle* estimates the earnings of 19 roads for the fourth week in April at \$696,127, a decrease of 19.20 per cent. The final statement of gross earnings of 74 roads for the third week in last month shows a decrease of 12.36 per cent. These figures reflect the severe depression still existing in business. Nevertheless, in a few directions there are some symptoms of improvement over last week. The settlement of the Great Northern Railroad strike, which threatened to have a serious effect on the business of a portion of the country, as well as of that of the Paterson silk weavers and the practical collapse of the Coxe movement, which, however ridiculous, had its sentimental effect, have removed those disturbing factors. The strikes of the bituminous coal miners and of the coke workers cover too wide a field to be likely to be of long continuance, and it is believed that the subsidence of these and other labor disturbances is a matter of the near future. Moreover, there is a growing conviction that the wearisome tariff discussions are nearing their end. The effect of compromise on the Wilson bill appears likely to shorten debate and allow it to become law by the beginning of the fiscal year. This prospect of definite action will, no doubt, tend to give a better tone to business. The volume of bank clearings throughout the country, notwithstanding the various causes for depression, show a gradual improvement. The decrease, as compared with last year, was only 25 % for April, as against 31 % for March and 37 % for February. The movement of goods throughout the country, meanwhile, has been more languid, owing probably to the termination of the spring trade. Jobbers, according to *Bradstreet's*, in all the large cities report sales as being entirely of a hand to mouth description, and orders for fall delivery are not meeting expectations.

The stock market, except for an extraordinarily erratic movement in Sugar certificates, has been almost at a standstill during the week. Speculation by the outside public has been unknown, and the scarcity of good stocks for investment business has been a marked feature of the market. Dealings in Sugar, the one great gambling stock, have monopolized more than half the total business of the Stock Exchange, nearly 360,000 shares having changed hands during the last four and a half business days. The fluctuations of the stock have been violent and continued

throughout the week, the pool which controls its destinies having forced it up and down, presumably for their own occult purposes. After flying up to 109½ it dropped more than 6 points by Monday, but on Tuesday regained some of its former loss, closing at 105½, on the publication of the compromise tariff bill, which grants ample protection to the refiners. Railroad stocks have been dull, but have on the whole held their own well, especially those of the Granger group. St. Paul was the most active during the present week, large selling orders having been transacted on the rumor that the company had sold a large block of bonds from the treasury and that the question of a fresh issue of bonds was on the carpet. The market closed on Wednesday dull and featureless, but with an undertone of strength and hopefulness. The following list exhibits the fluctuations of the more active stocks since May 3, together with closing prices:

	High- est.	Low- est.	Closing May 9.
Am. Sugar Ref.	109½	103½	104½
Atchison, T. & S. Fe.	13½	11½	12
Chicago Gas.	65½	64	64½
Chic., B. & Q.	81	78½	78½
Chic., Mil. & St. Paul.	62½	60½	61
Distilling & Cattle Fdg.	25½	23½	23½
Gen. Electric.	39	35½	36½
Lake Shore.	131½	128½	131
Louisville & Nashville.	49½	47½	47½
Missouri Pacific.	31	31½	29½
National Lead, Common.	41½	39½	38½
New Jersey Central.	110	108½	108½
N. Y. & New England.	8½	6	6½
Northern Pacific, Pfd.	19	17½	17½
Philadelphia & Reading.	17	15½	16½
Union Pacific.	18½	17½	17½
Western Union.	85½	84½	84½

The demand for first class investment bonds has been rather better, especially in the line of State and municipal mortgages. Railroad bonds have become more quiet. Government bonds have been firm, with some good sales. The closing quotations were as follows:

	Bid.	Asked.
2's, 1891, registered.	96	.....
4's, registered.	113½	113½
4's, coupon.	113½	114½
5's, registered.	111	118½
5's, coupon.	117½	118

The flow of currency from the West to this center appears to be diminishing in volume. The weekly statement of the Associated Banks, issued last Saturday, showed a decrease of \$609,800 in the amount of reserve held above legal requirements, the surplus now standing at \$82,808,150. An expansion of over \$2,250,000 in the loans was a gratifying feature of the statement, deposits increasing at the same time only \$4,840,400. The banks have been gaining gold while the Treasury has been losing it, through exports. The Treasury gold reserve has sunk to \$95,000,000, but the loss is not regarded with the same apprehension with which it was looked upon last year, in view of the large reserves of the metal held by the banks.

Money is still easy. Call loans rule at 1 %, and time money continues in abundant supply, but with moderate demand to meet it. Rates are 1 % for 30 days, 1½ % for 60 days, 2 % for 90 days, 2½ % for four months, and 3 % for longer periods. Commercial paper of the best grades is in active demand, and the supply of this class of material is rather more free, though still limited in amount. Rates, 2½ % @ 3 % for private indorsements, 3 % @ 3½ % for first-class single names, with four months to run, and 4 % @ 4½ % for others.

Sterling exchange has remained firm but dull. Bills are in limited supply and the demand fairly active. Actual business was done on Wednesday at:

\$4.87½ @ \$4.87½ for 60 days, \$4.88½ @ \$4.89 for demand, \$4.89 @ 4.89½ for cables and \$4.86½ @ \$4.86½ for commercial. Domestic exchange on New York is quoted as follows: New Orleans, commercial 75 premium, bank 150 premium; Charleston, buying par, selling ½ premium; San Francisco, sight 10, telegraph 15 premium; Savannah, buying par, selling ½ premium; Chicago, 10 premium; St. Louis, 25 premium.

Bar silver is steady and unchanged at 29½ pence 10 ounce in London and 64½¢ in New York.

Exports of general merchandise from New York for the week ending May 8 are reckoned at \$8,782,413, against \$6,112,041 in the preceding week and \$8,141,310 for the corresponding week of last year. Since January 1 exports have amounted to \$133,163,019, against \$118,390,797 for the corresponding period of last year.

Wheat has sounded new depths of depression during the week, making another low record on Tuesday, when May wheat closed at 59½¢ and July at 61½¢. Shipments have been comparatively small, and the large visible supply, together with favorable prospects for the coming crop, have precipitated an extensive liquidating movement in the grain. Corn is comparatively steady, owing to a decrease in the visible supply and limited offering. Cotton has been irregular, closing firmer than for some time past.

Metal Market.

Pig Tin—Regular trade purchases have been routine in character and merely fair all told. Speculative movement has been moderate also. Still prices have climbed quite as much as London fluctuations warranted, finally getting up to about 20.10¢ net cash for 5 ton or larger lots, prompt or near future delivery, with distant futures at some premium. The idea exists that pure manipulation has been largely instrumental in helping prices upward and that London operators are the chief manipulators. This idea is not without reason, since London fluctuations have apparently governed local prices in a great degree irrespective of the statistical position on this side of the Atlantic, while local representatives of leading London operators have been the stiffest bidders on both nearby and distant future deliveries. In actual sale prices have been carried to 20.10¢ @ 20.15¢ net cash for 5-ton or larger lots, while up to 20½¢ regular terms were paid for ordinary jobbing parcels. The supply in first hands here, it is estimated, does not exceed 700 tons, or the equivalent of about three weeks' consumption.

Copper—The situation is wholly unchanged. Home consumers are slow buyers and exporters more carefully in view of the weakish condition of the European market. The foreign markets, it is claimed, are not paying over the basis of 9½¢ for Lake Superior Ingot, relatively more for other varieties and special rates to large home consumers are said to be the rule rather than the exception. This on speculative offers to sell at 9.40¢ gives the market a weak appearance, although 9.50¢ stands as the popular quotation. Electrolytic is freely offered at 9.25¢, and it is understood that bids of 9.12½¢ have been solicited in numerous instances. Casting stock remains at about 9¢ @ 9.12½¢, with any advance on the inside rate purely the

exception where round lots may be involved.

Pig Lead—Merely routine business has been done here, and the demand has shown no spirit whatever. In fact, the only display of life was on the part of a few speculators who ventured to offer to sell at as low as 3½¢ for June and July delivery. They sold very little, if anything, although brokers obtained 3.40¢, 3.42½¢ and 3.45¢ for carload lots of desilverized from consumers. The indications are that a "bear" interest has been striving to force values lower by tricks with which they are familiar, and that speculative circles have been used to best advantage in that connection.

Spelter—Very little business has been done here and the Eastern demand has continued extremely tame. All signs of speculative interest have vanished, and the best efforts with consumers have been slimly rewarded. Hence a flat sort of market, with prices still rather soft at about 3.50¢ @ 3.55¢ for common Western, delivered here or at common point.

Antimony—Sales have been made at 8½¢ @ 8½¢ for Hallett's, 10½¢ @ 10½¢ for Cookson's, and corresponding prices for other grades. In a few instances quotations were made of as low as 10¢ for the former, but that price is considered exceptionally low.

Nickel—Prices are considerably apart, varying according to size of order, &c. There is merely routine business. The range of 40¢ @ 50¢ is quoted.

Tin Plate—Consumers have been taking spot goods in very limited way only. Purchases from other sources have also been on a rather small scale or hardly up to a moderate average for this season of the year. Prices have continued rather weak. In future deliveries there was no livelier interest than was shown a week ago and prices throughout are still more or less in buyers' favor, but show no quotable change. For stock on the spot we quote as follows: Coke Tins—Penlan grade IC, 14 x 20, \$5.10; J. B. grade, full weight, \$5.15; light weights, \$4.75 for 100 lb, \$4.62½ for 95 lb, \$4.55 for 90 lb; Bessemer full weight, \$5.15; light weights, \$4.70 @ \$4.75 for 100 lb, \$4.60 for 95 lb, \$4.55 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.35; Siemens Steel, IC basis, \$5.45; IX basis, \$6.50. Charcoals—Melyn grade, IC, \$6.25; Crosses, \$7.75; Alloway grade, IC, \$5.40; Crosses, \$6.50; Grange grade, IC, \$5.50; Crosses, \$6.60. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.25; M. F., 14 x 20, \$7.20; do., 20 x 28, scarce; D. R. D. grade, 14 x 20, \$5; do., 20 x 28, \$9.75; Alyn grade, 14 x 20, \$5.20; do., 20 x 28, \$10 @ \$10.25. Wasters—S. T. P. grade, 14 x 20, \$4.60; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.50; do., 20 x 28, scarce.

Harold C. Dayton & Co., who are agents of the National Bolt, Nut & Rivet Works, of the Bloomsburg Car Company and of B. W. Payne & Sons, makers of Engines, Boilers and Tanks, have removed from 41 Day street to 44 Dey street. They have just been appointed agents of the Milton Iron Company of Milton, Pa., manufacturers of Refined Bar Iron and Iron and Steel Axles.

New York.

Office of *The Iron Age*, 98-102 Reade street, New York, May 9, 1894.

Pig Iron—There is only a moderate run of inquiries and current business is light. Some of the furnace agents have had instructions to withdraw from the market, but in spite of that competition continues keen and prices have not been favorably affected as yet. We quote standard brands \$12.50 @ \$13.25 for No. 1; \$11.25 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12.25 for No. 1; \$10.50 @ \$11 for No. 2; \$10 @ \$10.25 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25.

Cast Iron Pipe—There is more inquiry, but as yet little has been placed. The Laconia, N. H., Gas Company have bought about 1000 tons.

Billets and Rods—In sympathy with the rise in the West the market is higher. We quote \$18.50 @ \$19, tidewater, for domestic, and, nominally, \$27 @ \$27.50 for foreign. Domestic Wire Rods are nominally \$26.50 @ \$27.50, and foreign \$39 @ \$40, tidewater.

Steel Rails—The market in the East is very dull. Quotations remain \$24.80 at tidewater for standard sections, \$22 @ \$24 for Light Rails at tidewater and \$20.50 @ \$22 for Girder Rails.

Track Material—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel—Aside from a moderate run of small orders very little has been done. The work for the extension of the Hotel Savoy, involving about 750 tons of material, has been placed with a Pittsburgh mill. Prices on Finished Iron and Steel have not as yet advanced in this market. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.15¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.30¢ @ 1.50¢, on dock. Steel Plates are 1.20¢ @ 1.30¢ for Tank; 1.35¢ @ 1.40¢ for Shell; 1.55¢ @ 1.60¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.20¢; Soft Steel Bars are 1.15¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 65¢ @ 70¢ @ 45-lb bundle, at mill; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.80¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

C. D. Watson, who was formerly with the Millerton Iron Company, has been appointed Eastern representative of Henry M. Warren & Co., Pig Iron merchants, of this city, with headquarters at 70 Kilby street, Boston.

G. W. Smith, broker and dealer in Iron, Steel, Machinery and Supplies, has removed his office from 45 Broadway to 126 Liberty street, New York.

Lewinson & Just, contractors and consulting engineers, have removed their offices from 90 Nassau street to 128 West Forty second street.

W. A. Washburne, who for the past five years has been connected with the

New York office of the Pennsylvania Steel Company in their sales department, has recently been made the New York sales agent of the Cambria Iron Company, with headquarters at 33 Wall street.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, May 9, 1894.

Pig Tin sold early in the week at as high as £73 and receded subsequently to £71. 15/. From the latter point there was a substantial reaction. The influences were about the same as those that operated last week, consisting of good buying of prompts, alleged to be mainly for American account, with intermediate good selling of both prompts and futures on local account. Speculation seems to have been gauged in a good measure by the fluctuation in silver. At the close the market was steady. Straits quoted at £72. 10/ for prompt delivery and £73. 2/6 for three months' futures.

Under selling by tired holders and pressure from bear operators prices for Merchant Bar prompts were forced to as low as £39. 6/3. A rally followed on fair buying and reports of Copper going into stronger hands, and this seemed to offset returns showing continuous falling off in English exports. At the close the market was steadier. Merchant Bars were quoted at £39. 17/6 for prompt delivery and £40. 7/6 for three months' futures. Best selected English is at £42. 10/ @ £42. 15/.

In Tin Plate business has been limited, but there is some sign that buyers are more inclined to make contracts. Canadian buying of Charcoals and Terns is particularly favorable. Exports last month were 24,000 tons, against 39,000 tons in April, 1893. Shipments to the United States were 13,000 tons and 31,000 tons respectively. Stocks at Swansea are now about 276,000 boxes. Output of works has greatly receded owing to dispute with operatives, but is still fair and exceeds shipments. Morfa Works have been closed down owing to depressed condition of the market. Liverpool quotations are as follows:

1C Charcoal, Alloway grade.....12/ @ 12/6
1C Bessemer Steel, Coke finish.....11/3 @ 11/6
1C Siemens.....11/6 @ 11/9
1C Coke, B. V. grade, 14 x 20.....Nominal
Charcoal Terne, Dean grade.....10/3 @ 10/6

Pig Lead prices have weakened to £9 for soft Spanish, and there is little business at the decline. Offerings are quite free.

Spelter has met with slow sale, and the market is soft. There are sellers at £15. 12/6 for soft Spanish.

Pig Iron exports are fairly large, and amounted last year to 81,354 tons, against 81,733 tons in April, 1893. A brisk demand is reported for Ship Plates, and the market is firmer. In other branches of the Iron trade there is no change. In warrants there has been a fall to 41/10 for Scotch, 35/3 @ 35/4 for Cleveland and 44/6 for Hematite.

Canadian Notes.

The remonstrances of the bar iron manufacturers and of others dissatisfied with the metal schedule of the new tariff have failed to create an impression on the mind of the Government. The duties on iron and steel have now been considered by the House in Committee of the Whole, and passed with a single amendment: changing the duty on spiegeleisen from 10 to 5 per cent. ad valorem. The crucial point in the schedule was the duty on wrought scrap. The strong representations against this by the rolling mill people and the immediate cut in wages made by one concern when the tariff was first announced led to the expectation that in pursuance of its declared protective policy the Government would reconsider that item. The fact that several other changes had been made in committee, and that all such changes were upward, strengthened this expectation, and left consumers in doubt as to what modifications might be made as the result of petition or ministerial second thought. This doubt led to hesitation in business. The suspense of manufacturers who consume finished iron had the same effect. They want to have the new rates confirmed before they proceed to add to their output or continue paying present wages. As what is passed by the House in committee is certain to be passed in regular session, the manufacturers interested now know what to expect. It is generally taken for granted that bar iron cannot be made from wrought scrap after this year, when the duty on scrap becomes \$4, or twice what it was. In the mean time it is \$3.

The importations of Scotch iron this spring have fallen still further away from their ancient mark. Of the leading brands not more than 300 tons have been brought in. Domestic and American irons have displaced them to the extent of the shrinkage. Montreal, the last stronghold of Scotch iron, begins to find cost, freight and quality in American brands quite as favorable as in British. Canada is increasing her contribution of second grade iron to domestic consumption.

Business in cut nails is extremely dull, and they are offering at a shade on \$1.80 in car lots. This price and the slow trade reflect the influence of the small reduction in the duty on nails. Outside competition is beginning to tell since that reduction. The representative of an Ohio concern is known to have made some very low offers—below those ruling here—on a certain class of cut nails.

The Philadelphia Engineering Company, Philadelphia, have the contract for putting up the smelting works and plant that are to be erected at Hamilton. The price is \$360,000, and the works are to be running in December.

A new wire nail factory with a capacity of 50,000 kegs per year is to be erected at St. John, N. B.

Some large purchases of Canada plate have been made in England on Canadian account for July and August shipment. The prices are uncommonly low.

The railway companies have made very large reductions in the staffs of their mechanical departments. This has led to a great decline in the railway demand for heavy metals.

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HARDWARE.

Condition of Trade.

THE FINE WEATHER and the natural movement of trade have induced something of an increase in the volume of business from the retail trade, and many carefully assorted orders for small quantities are being received. Stocks are kept light, and buyers are avoiding purchases at all in excess of their early needs. The tone of the market causes a close adherence to this policy, it being recognized that prices on many goods are weak as well as low. There is accordingly little confidence in the stability of present quotations, even on such goods as have receded so far as to leave little probability of their further decline. Reports from the trade indicate that on the whole a healthful financial condition prevails. Although there is some complaint in regard to collections, there are few houses who are regarded as being in financial difficulties. Quotable changes in price are few, but there is a disposition on the part of both the producers and distributors of goods to make concessions when necessary, and on many goods there has been a perceptible settling in price during the past few months. There is thus an opportunity for buyers to exercise judicious care and skill in the placing of their orders.

We have the pleasure of announcing that Miller, Sloss & Scott of San Francisco, successors of Huntington-Hopkins Company, will hereafter furnish reports of that market in connection with the other reports which we are publishing twice a month from representative houses in the leading trade centers, the value and interest of which are recognized by Hardware merchants and manufacturers throughout the country. The first letter of this enterprising and influential firm, which was received too late for use in our last issue, is given in another column.

Chicago.

(By *Telegraph*.)

Quite an improvement is noted in general business by the Shelf Hardware jobbers. The good weather of the past week has been favorable for outdoor work, and improvements are generally being made by farmers at this

time of the year. Their demand is putting the country merchants in good condition to continually add to their stocks. The crop prospects are very flattering throughout the entire Northwest, and reports received from all quarters are now very encouraging to merchants in all the jobbing centers of this section. They are advising their correspondents to have no hesitation to lay in stocks of such goods as are in ready demand, having no apprehension that prices will be lower than are now current. Some lines of staple goods are very firm and show a tendency to advance. The coal strike is, of course, the most important element in this direction, but there are other influences at work which are expected to keep prices firm, if not to advance them. The jobbers in Tinware and House Furnishing Goods are not in quite so good condition as their Shelf Hardware brethren, and so far have experienced very little improvement in their branch of trade. The Heavy Hardware jobbers likewise report business quiet in their line, owing to the light demand from manufacturing establishments whom they supply with goods. The Tin Plate trade preserves the same features previously noted. Roofing Plates are very scarce. Every American mill appears to be loaded up with business, and brands are being withdrawn from the market, as the manufacturers are not in shape to take additional orders for early delivery. Under the circumstances prices might be expected to advance, but for some reason the scarcity has so far failed to enhance values.

St. Louis.

(By *Telegraph*.)

There is an excellent improvement noted in the demand for shelf goods, which if it continues will make the present month a great improvement over April in this respect. The coal famine if continued for a week or two longer will have more or less influence in determining the character of trade, and it is expected will result in a sharp advance in some lines of goods. The only article which seems to be advancing at this writing is Wire Cloth, which is now quoted firm at \$1.55 to \$1.60. The mills are going through the same experience of last year, and are all running behind their orders, with no possibility of catching up with them. Jobbers appear to be well supplied, and we are advised by the Ludlow-Saylor Wire Company that their stock of Wire Cloth is heavy enough to meet any demand which may be made upon it, thus proving conclusively that there will be no shortage of Wire Cloth in this section. The

advance in Tacks has been maintained, but Wire Nails, if anything, are weaker than last reported. There appears to be no confidence in the future of the market, and jobbers and dealers alike are undecided whether it is desirable to stock up now or later on. Until this indecision is swept away any material improvement is out of the question.

San Francisco.

MILLER, SLOSS & SCOTT.—It is now some eight weeks since you published a letter from San Francisco. About that time your former correspondents, Huntington-Hopkins Company, retired permanently from business, and as their successors we are pleased to take up the good work and hope to let you hear from us regularly in the future.

Being the most interested parties we naturally feel that the purchase of the business of Huntington-Hopkins Company and the absorbing of it with our own business has been the greatest item of news to report from our city. This transaction has been commented upon in a former edition of your paper, so any further mention of it here is unnecessary.

At this date, perhaps, the most important news item has been the abandonment of the steamship line between Panama and San Francisco, which, in conjunction with connections on the Atlantic side, had been the only opposition to our railroad. The North American Navigation Company were originally organized by the merchants in San Francisco, who hoped by maintaining such opposition to the railroad to be able to secure permanently for our city a satisfactory freight rate on overland business. It is, therefore, rather a blow to the San Francisco merchants that they have had to abandon their line, although the opposition is still in force, the entire business being conducted this time by the Panama Railroad Company.

Overland freight rates have also been subjected to considerable of a change. The Sunset Route owns the only through line from New York to San Francisco; therefore it is these people who have been suffering most through the opposition of the North American Navigation Company, and their rates from New York were at the time of the Navigation Company's organization placed at so low a figure as to defy competition.

It appears that other railroads, finding that on account of this reduction all business was going to New York, and thence by Sunset Route to San Francisco, recently reduced their own tariff so as to make the freight rates from Chicago and St. Louis equal the Sunset rates from New York. This tariff has only recently gone into effect and we shall now again be able to forward goods direct from the West, as you call it, to San Francisco, without the necessity of forwarding them through New York to obtain the best freight rates.

Trade in general in San Francisco has not been up to previous years. Our entire State has been suffering from

the long continued spell of dry weather, which has done immense damage to the crops. We had no rain at all for the last seven weeks until yesterday. The slight rainfall we have had now we hope will be of considerable benefit, although reports from certain sections of the State advise that the crops will be an absolute failure. We cannot expect any rain after May 1, so that if we do not have more rain within a week, we cannot expect a great deal of money to come into the State through the crops. This will be a very serious blow to California, but the rain of yesterday and the present predictions for still more rain make us hopeful. The fruit crop will be good without further rain, as most of our fruit sections are prepared to irrigate.

Collections have been as good as usual at this time of the year. As all country merchants are buying very cautiously they should be able to meet payments by harvest time.

Our city just now is full of visitors from all sections of the State, who have come here to visit our midwinter fair. We find, also, that it has drawn many from the East, who all seem pleased, though of course we do not presume our show compares with the great fair at Chicago.

Notes on Prices.

Wire Nails.—The market is in substantially the same condition as last week, with perhaps a slightly firmer tone, on account of the uncertainty as to the effect of the strikes. As a result, manufacturers are not soliciting business so eagerly, and are not offering inducements so freely as a week or two ago. The volume of business continues good, though not specially heavy. It is made up for the most part of relatively small lots, but it is understood that some large buyers are in the market. Quotations for car-load lots at mill are 95 cents up to \$1, the former figure being usually obtainable. Small lots from store in New York are quoted at \$1.15 to \$1.25.

Chicago, by Telegraph.—A good demand is reported for Wire Nails from points further west, and in some cases orders are coming in by wire. The city trade is less active than that originating in the country. Sales have been made by manufacturers at a slight advance over recent prices. Several factories are now known to have been stopped on account of the coal famine and others are expected to drop out during the present week. One of the largest concerns in this vicinity has therefore advanced its prices 5 cents per keg on Nails to be shipped from warehouse on account of the stoppage of the factory. Mill shipments are now firm at about \$1.05 to \$1.10, Chicago, with an advancing tendency. Jobbers quote small lots from stock at \$1.10 to \$1.15, but talk of advancing their prices at an early day, owing to the pressure from the mills.

Cut Nails.—The Cut Nail market also feels to some extent the influence of the labor troubles and the uncertainty as to their duration and effect. Prices are only slightly affected, the market being given a somewhat firmer tone in view of the fact that manufact-

urers are not disposed to make concessions as freely as heretofore. The Western price is about 90 cents for car-load lots at mill. The price of Nails delivered in New York is 95 cents to \$1 base, small lots from store being held at \$1.10 to \$1.15.

Chicago, by Telegraph.—Manufacturers report a fair business during the week, with moderate sales to merchants in all sections of this immediate territory. While trade in this line has not been heavy it is as large as usual at this season. Prices are continued at 95 cents, Chicago delivery, on factory lots of 55-cent average. Jobbers quote small lots from stock at \$1.05 to \$1.10.

Barb Wire.—The demand for Barb Wire continues remarkably good for the season, and the volume of business is fair. The tendency toward irregularities in price has been checked somewhat by the uncertainty as to the outcome and effect of the strikes, and quotations continue with a slightly better tone about as last week. They are as follows for Four-Point Galvanized: Pittsburgh, \$2.05 to \$2.15; Cleveland, \$2.10 to \$2.20; Cincinnati or Allentown, \$2.15 to \$2.25; Chicago or New York, \$2.20 to \$2.30.

Chicago, by Telegraph.—Manufacturers have experienced a falling off in the demand recently, but the stoppage of some works on account of the Coal strike has apparently counterbalanced the restriction in trade and prices continue firm. Some manufacturers are advising their correspondents that an advance can be expected at an early day if the Coal strike does not soon terminate. Jobbers report a fair demand from stock. Quotations may be continued at \$2.15, Chicago, for factory lots of Galvanized Barb Wire and \$2.25 to \$2.35 for small lots from stock.

Rapid Acting Vises.—A description of Nos. 20 and 30 of the Rapid Acting Vises put on the market by the Rapid Acting Vise Company, 35 to 41 East Indiana street, Chicago, was given in our issue 26th ult. The No. 20 Vise has 10-inch jaws and opens 12 inches. The No. 30 Vise has 8-inch jaws and opens 12 inches. The No. 20 is sold at \$6.50 and the No. 30 at \$7.50, these prices being subject to a discount of 25 per cent. to the trade.

Philadelphia Ice Chisel.—This article was described in our last issue. It is manufactured by John Stortz & Son, 210 Vine street, Philadelphia, by whom it is sold to the trade at \$3 per dozen net.

Star Coil Spring Shaft Support.—The Decatur Shaft Support Company, Decatur, Ill., are putting this article on the market, a description of the Support having appeared in our issue April 26. The Support is sold to the trade at \$10 per dozen net.

Boss Barrel Nail Puller.—Specialty Mfg. Company, Hartford, Conn., who are putting this article on the market,

are selling it to the trade at \$15 per dozen, subject to a discount of 10 per cent. The Puller was described in our last issue.

Nut Lock and Washer.—Horton, Gilmore, McWilliams & Co., 173 to 176 Lake street, Chicago, quote the following list on the Porter patent Combination Nut Lock and Washer, with a discount of 35 per cent. to the trade:

SIZE.		
3/12,	250 round, per pack....	\$5.00 per 1000
3/16,	" regular, " "	5.00 " "
1/4,	" " " "	5.00 " "
5/16,	" " " "	6.67 " "
3/8,	" " " "	6.67 " "
7/16,	" " " "	6.67 " "
1/2,	" " " "	8.35 " "
5/8,	" " " "	8.35 " "

This Nut Lock is put up in a handsome antique oak counter case containing 21 pockets, holding about 4000 of seven sizes, assorted, and having extra pockets for ordinary washers as well.

Glass.—Manufacturers are still in an unsettled state of mind regarding the future of the Glass market, which uncertainty will not be relieved until the tariff question is settled; and under present conditions there is no incentive to store the product of factories. Demand appears to be equal to the present output of Glass, or so nearly so that stocks are not accumulating to any great extent in manufacturers' hands. The firmer market and advance in quotations during the past two or three weeks are looked upon as encouraging, and something like 85 additional pots are reported as having gone into operation during the past week. The largest stock of Window Glass in the country is understood to be in the hands of the Syracuse Glass Company, Syracuse, N. Y., amounting to 45,000 or 50,000 boxes. This has been accumulating, as the company refused to sell at prices which have been ruling. Indications are, however, that this Glass is now being offered at conservative figures, approximating present quotations. It is too early to predict what effect the changes of rates in the Glass schedule of the tariff bill, as reported to the Senate May 7, will have upon the future Glass market if it passes in its present form. Pittsburgh factory quotations are reported as being 85 per cent. discount for single and 85 and 5 per cent. discount for double strength Glass. Present conditions indicate a favorable outlook for the Plate Glass trade in the near future, in anticipation of which additional factories are reported as preparing to start up. Quotations remain 70 and 10 per cent. discount for New York.

THOMPSON & HOOVER, 84 West Broadway, New York, are representing manufacturers in Eastern territory, embracing the New England States, New York, Pennsylvania and Maryland. Mr. Thompson was formerly with an export house in New York and for the past year has been the manager in this city of the Geo. F. Eberhard Company, looking after both their domestic and foreign business. The new concern has taken over a number of the lines until recently represented by the Eberhard Company.

Western New England Iron, Steel and Hardware Association.

THIS ASSOCIATION, to the organization of which we have already referred, is similar in its general features to the New England Iron and Hardware Association, which has been in successful operation for the past year or two. The headquarters of the Western Association are at New Haven, Conn., where the secretary, R. S. Woodruff, resides. Any houses "dealing in Iron, Steel and Hardware, doing business and carrying a stock in Western New England and the State of Connecticut" are eligible for membership. Regular meetings are to be held on the second Friday of every other month, dating from February last, and at such meetings the representatives of the houses in the association shall dine together, the price of the dinner being paid from the treasury of the association, the annual assessment of each member being \$20.

It is not intended that the association shall attempt to regulate prices, but one of its principal objects is to promote acquaintance and friendliness among its members. The desirability of this is indicated in the fact that at the first meeting which was held in February it was found that many of the dealers in Iron and Steel who had been competitors for the past 25 years had never had the pleasure of meeting one another, being only known to each other by sharp competition. There is no doubt that by coming together and becoming better acquainted and reaching an understanding in regard to many things of mutual interest, much petty jealousy will be done away with and confidence in one another promoted.

There are also many abuses which can receive attention from an association of this kind, such as the annoyance and demoralization resulting from outside competition. It is thought that something may be accomplished toward diminishing the evils to which the trade in the territory covered by the association are subjected.

An important feature of the association's work is in regard to the matter of credits. They have established a Bureau of Credit and Information whereby any member of the association can report to the secretary any delinquent party, and until he has settled his claim no member of the association will give him further credit. By this means it is expected that an accumulation of bad accounts can be prevented and the general good of the trade promoted. This feature of the association is similar to the one with headquarters in Boston, the work of which has been found to be exceedingly satisfactory.

The next meeting will be held in June, and it is expected that the Iron and Hardware trade throughout Western New England will be largely represented.

Hardware Merchants and Manufacturers' Association

AT THE LAST MEETING of the Philadelphia Hardware Merchants and Manufacturers' Association unusual interest in the proceedings was displayed by the members, the association room being taxed to its utmost capacity, some 40 persons being present. William W. Supple, the newly elected president, occupied the chair. T. James Fernley, secretary and treasurer of the organization, reported an increase in the membership roll since January of 7 active, 4 contributing, 1 honorary and 25 non-resident members. The following concerns were elected to membership at the meeting:

Active.

NICHOLSON & RENWICK, Philadelphia.

Contributing.

T. ROWLAND'S SONS, Philadelphia.

Non-resident.

HUMASON & BECKLEY MFG. COMPANY, New York.

UNION METALLIC CARTRIDGE COMPANY, New York.

DAVID MAYDOLE HAMMER COMPANY, Norwich, N. Y.

AUSABLE HORSE NAIL COMPANY, New York.

KILBOURNE & JACOBS MFG. COMPANY, Columbus, Ohio.

SEYMOUR MFG. COMPANY, St. Louis.

JOHN CHATILLON & SONS, New York.

R. E. DIETZ COMPANY, New York.

NICHOLSON FILE COMPANY, Providence, R. I.

WALDEN KNIFE COMPANY, Walden, N. Y.

Owing to the rapid growth of the organization it was decided to incorporate it under the laws of the State of Pennsylvania.

Requests for Catalogues, Price-Lists, &c.

New Store.—J. A. Myers about June 1 will open a new Hardware store at Bryan, Texas. Mr. Myers advises us that he would be pleased to receive catalogues, price-lists, &c., relating to Hardware, Paints and Oils, Window Glass, &c.

Hardware Club.—We are requested to call the attention of manufacturers again to the fact that it is intended to have in the library of the Hardware Club of New York as complete a collection as possible of catalogues, price-lists, &c. It is expected that in a certain way this club will be the center of the Hardware trade of the entire country, and connected with it will be many houses interested more or less in foreign business, and that reference will often be made to the printed matter of manufacturers in order to ascertain the different lines of goods they are putting on the market. The club rooms will soon be open, and the committee in charge of this matter are desirous of having manufacturers' catalogues and price-lists without delay. They may be sent in the care of A. D. Clinch, 94 Chambers street, New York.

Letters From the Trade.

Selling to Consumers.—Among the annoyances with which dealers, especially in the smaller towns, have to contend, the selling of goods to consumers by jobbers and manufacturers appears to be prominent. The line particularized by the correspondent is Guns and other sporting goods. The consumer, he states, is not always solicited by the traveling men who sell his firm, but he considers this no excuse for selling direct to their customers. Another instance of selling direct is cited as follows:

A manufacturer's representative sold Horse Nails to blacksmiths in our town to be delivered May 1, and stated he would not be around before December 1 to receive pay for them.

Nails—Wire vs. Cut.—A correspondent refers to Wire Nails as having been found unsatisfactory by carpenters in his section, and quotes as follows from a letter from one of them:

They will split the wood when driven near the end sooner than a Cut Nail, and they will not stand a last blow if the board is a trifle warped, because they lose their grip. For toe nailing they are a fraud, and will raise a stud-ding from the sill if you try to draw on them. For building board side-walks, the heads will serenely bob up to the extent of $\frac{1}{2}$ inch in a few months, not to mention a carpenter's hands being as black and greasy as a machinist's, leaving finger marks all over the wood work, while the carpenter's nail apron is punctured by them.

Regarding the liability of Wire Nails to rust out on shingle roofs, the opinion is expressed that they have not been in use long enough to decide upon this point. Our correspondent also makes the suggestion to Cut Steel Nail manufacturers that if the temper of the Nails was reduced so that the heads would not fly off when driven home, carpenters would largely return to their use, as the great objection to Cut Steel Nails is the tendency of the heads to fly off.

In this connection reference is made to the fact that Steel Nails rust sooner than Iron Nails, and for this reason their use on outside work has, in some cases, been discontinued. The following instance is given as showing the shortness of life of Cut Steel Nails:

Saved pine shingles were laid on a large roof, using 4d Cut Steel Nails and employing two Nails to every shingle. Within three years the Nails began to rust in two in the middle and the shingles to drop down. In five years the roof was recovered with tin. It was rather a steep shed roof and had a southern exposure.

A Poor Use for Trade Papers.—A traveling man of keen observation and many years' experience calls our attention to a certain use made by many retailers of trade papers which is harmful to their own interests; this is in using them for wrapping paper.

The point is not that they are too good for such use, that it is beneath the dignity of a trade paper to be used to cover a pound of putty or a light of glass, but that it is unwise upon the part of a retail merchant to place in

the hands of his customers either the trade advertisements or quotations made for the eyes of the dealer alone.

There is a constant tendency upon the part of consumers to save the retailers' profit. When they find a full address on a package of an article of which they are large consumers they quickly try to get the goods direct. Retailers complain because this is done, yet any person of observation will find the average retailer using a trade paper, with its special prices and information gathered for his eyes alone, as wrapping paper on his counter.

A great many trade papers reach a retailer for which he never subscribed, and he generally looks upon them as being of no value to him. He fancies he is getting a little good out of them by using them in the way described, but in fact he is placing them where they may do him great harm.

One ought to treat the trade paper exactly as he would private letters quoting prices. He never places these where his customers can see them; but the printed quotations are equally harmful. Why should they be distributed through the homes or shops of his customers?

A trade paper is prepared for the dealers in its special line. Information as to prices is given that will be helpful to these. Manufacturers advertise in it to bring their goods before the trade, and quote prices to enable retailers to see the advantage of handling their special goods. But when the retailer hands out this information and these advertisements to his own customers, he must not complain if he discovers that they are availing themselves of this means to buy nearer the head, or at lower prices than before.

Nail Card.—A Hardware firm in the South writes as follows in regard to what they consider an inequitable practice in the quoting of Nails:

The fact that large Nails are selling for less than Bar Iron, and that specifications must include enough small Nails or finishing, &c., to make a certain average, seems to prove that small sizes are sold at a price to make up the loss (if any) on the large sizes, so that those who use mostly small Nails pay more than they should for them, and those using large sizes less, which is not fair to those using small sizes.

Mail Orders.—Because some concerns do not make a practice of filling mail orders at the lowest prices they give unless quotations have been given beforehand, a Southern retail house advise us that they are deterred from sending open orders for goods. Better prices, they say, are given when they buy in person, or through traveling salesmen who know best how their customers buy and what competition they have. Hence, it is remarked, the usefulness of the drummer to employers and their customers.

THE CRAWFORD MFG. COMPANY, Hagerstown, Md., and 72 Reade street, N. Y., issue a catalogue devoted to high grade and juvenile Bicycles. The line of Crawford machines include Nos. 7, 8, 9, 10, 11, 12, 13, 14 and 0. These range in price from \$125 to \$25, four of the wheels being ladies'. The leading machines—Nos. 7 and 8 for gentlemen and ladies—are fitted with wobbly rims and Palmer tires, listing \$125.

Transportation Statistics.

AT THE RECENT DINNER of the Manufacturers' Association of Kings and Queens Counties a carefully prepared paper was presented by Lowell M. Palmer in response to the toast "Transportation." Mr. Palmer spoke principally of the railways of the land and touched upon the great water routes and foreign commerce only incidentally. From his able and interesting address we make the following extracts:

A great change has taken place in the roadbed, bridges, rails and general equipment of our railways during the past ten years. In the year 1880, out of a total mileage of 115,000 miles, 81,000 miles consisted of iron rails and 33,000 miles, or 29 per cent., consisted of steel rails. In the year 1892, 82 per cent. of the entire railway mileage of the country was laid in steel rails. Not only is this the case, but the weight of the rail has increased from about 56 pounds to the yard up to 85 pounds, and in some instances 96 pounds, to the yard, as is the case with all new rail laid by the New York Central and Pennsylvania railways within the past two years. Bridges have increased in proportion; capacity of cars has been increased from an average of 10 tons 20 years ago to a standard capacity of 30 tons with all cars built within the past three years. In the meantime, the cost of this change of structure has been borne by the railways without any increase to the general public in the cost of carrying freight and passengers. On the contrary, the rates for carrying freight per ton per mile are just about one-half to-day what they were 25 years ago, being decreased just about in proportion that the strength of structure has increased.

The rates per ton per mile realized for a year in this country, as compared with European railways, are as follows: United States, 97 cents per ton per mile; Prussia, \$1.37 per ton per mile; Austria, \$1.56 per ton per mile; France, \$1.59 per ton per mile; Belgium, \$1.39 per ton per mile. And if the railways of the United States for the year 1892 had received the lowest of these charges, those realized in Prussia, they would have received on freight and passengers carried a total of \$370,000, 000 more than they received under our carrying rates for that year.

Of the tonnage of the United States, 75 per cent. lies within the boundary of the Mississippi River on the west, the Atlantic Ocean on the east, the Ohio and Potomac rivers on the south and the Canadian border on the north. This fact is worthy of notice, as it shows where the producing and manufacturing interests of this country lie, and shows clearly who will "get hit with a brick" if the income tax contemplated in the present tariff bill becomes a law.

The railway mileage of the world foots up to-day 369,000 miles, thus giving the United States 47 per cent. of the mileage of the entire world.

The net earnings of the railways of the United States for a period of years on capital invested were as follows: 1880, 4 $\frac{3}{4}$ per cent.; 1885, 3 $\frac{1}{4}$ per cent.; 1886, 3 $\frac{1}{4}$ per cent.; 1887, 3 $\frac{1}{4}$ per cent.; 1888, 3 $\frac{1}{4}$ per cent.; 1889, 3 $\frac{1}{4}$ per cent.; 1890, 3 $\frac{1}{4}$ per cent.

The registered tonnage of American vessels engaged in foreign commerce for the year 1890 was 4,424,497 tons, against the registered tonnage of foreign vessels entering American ports of 18,107,261 tons, thus giving about 25 per cent. of the registered tonnage of the foreign carrying trade to American ships. The entire ocean tonnage of the United States for the year 1892 was less than 30,000,000 tons, against the internal commerce of the railways alone, stated above to be 749,000,000 tons, so that our foreign commerce, as compared with our internal commerce, without taking into account the tonnage of our canals and our rivers, stands in the relation of 30 for the foreign as against 749 for the internal.

The traffic of the Great Lakes passing the Detroit River, and not counting any local traffic, amounted for the same year to over 36,000,000 tons, or say 6,000,000 tons more than the entrances and clearances of all seaports in the United States, and 3,000,000 tons more than the combined foreign and coastwise shipping of London and Liverpool together.

Directory of Exporters.

PADDOCK & KLINE, 107 Chambers street, New York, have just published a New York Directory of Exporters. It is a cloth bound book of 96 pages, 5 x 7 inches in size. It contains the names of commission houses, purchasing agents, brokers and shipping agents who buy for export, with a general classification of the kind of goods dealt in. The names are first given alphabetically with addresses. Then the names are duplicated alphabetically by streets, the street numbers being given in numerical order. This facilitates the finding of a concern, if only the street or locality is remembered. Statistics in regard to the leading articles of merchandise exported from this country for the year ending June 30, 1893, the addresses of the foreign consulates in this city and other information connected with export interests is given. The book is admirably arranged and will be of service to the increasing number of those interested in export trade.

FREDERICK HABERMAN, until the last annual meeting in January a trustee or director in the Central Stamping Company, 23-25 Cliff street, New York, has asked permission from the Attorney-General of New York to bring suit for the purpose of annulling the charter of the latter company. This company was formed in 1884 by the amalgamation of the following companies—viz.: James Aikman & Co., E. Ketcham & Co., St. Louis Stamping Company, Lalance & Grosjean Mfg. Company and F. Haberman. The Attorney-General referred the whole matter to Judge O'Brien of the New York Supreme Court, who finally granted the necessary permission on the filing of bonds by F. Haberman to cover cost of suit. Judge O'Brien then granted a stay of proceedings against his own decision, referring the whole matter to the General Term of the Supreme Court, argument being set down for May 7, which was afterward postponed to May 11.

Did You Lock the Door?

DID YOU ever stop, as you had reached your own gate, and try to recall if you had locked the store door? The city merchant, who never locks his door, cannot understand this question as we do who often are the last out of our stores at night.

The process of thought is always the same. From some corner in the laboratory of the brain, apropos of nothing whatever, the question is suddenly shot at you: Did you lock the store door?

You remember distinctly closing the safe; bolting the back doors; fastening the shutters; turning out the lights, except the one you leave lit all night; going out the door and closing it; but there you are at a standstill. You went in and out that door a great many times during the day, but whether you locked it this time or not you cannot recall. If you did, it is as effectually brushed from your memory as if it was not.

Then you begin to reason: Of course you locked it; you must have done so. You could not go away without locking it. Hold on! you once did do that very thing. Just once from the thousand times that you never missed. Perhaps this is the next time. But no; you don't believe you omitted it to-night. You are sure you locked that door, and you are going to drop it out of your mind and trust to luck. So you go home.

You find, however, that you cannot dismiss the question. It comes before you as you read your evening paper. It intrudes itself between you and your family. It destroys the story in which you were so much interested the previous evening, which you expected to finish with greater pleasure to-night. In the middle of the most touching passage you find yourself asking again, Did I lock the store door?

At last, just as your wife, for the third time, has reminded you that you are sitting up very late, you clench your teeth and say you will not stand it a moment longer: you will go back to the store and see if the door was locked, otherwise you will be tortured by the doubt all night.

So you catch a car if you can, or you tramp back to the store, and you grasp the latch, hoping that you will find the door unlocked, for then you will have more respect for yourself in making this trip.

But of course the door is locked. No man ever went back on such an errand and found it otherwise. He calls himself several very derogatory names, hurries home as fast as he can, goes to bed and sleeps all the better for his trip.

Does this cure him of doubting about the same thing when again it comes into his mind? By no means. You and I know that previous experience counts for nothing. We pass through the same questioning to the same end, always to find the same answer: We had locked the door.

But one night we are so mightily disgusted with ourselves for permitting the doubt to enter our mind that we sturdily refuse to be led back to the store, and we compel ourselves to sleep. And this proves to be the one night that we did not lock the door, and we are either robbed, or, what is often much worse to bear, the clerks discover we are not the pattern of perfection we have aimed to be considered, and for a long time we have to be very

Arrangement of Stores.

THE store of N. P. Hayes, to which the following illustrations relate, is located on the corner of William street and Acushnet avenue, New Bedford, Mass. The building is a substantial brick structure, three stories high, devoted to a stock of General Hardware, Cutlery, Tools and Agricultural Implements. Great care has been taken by the proprietor in the

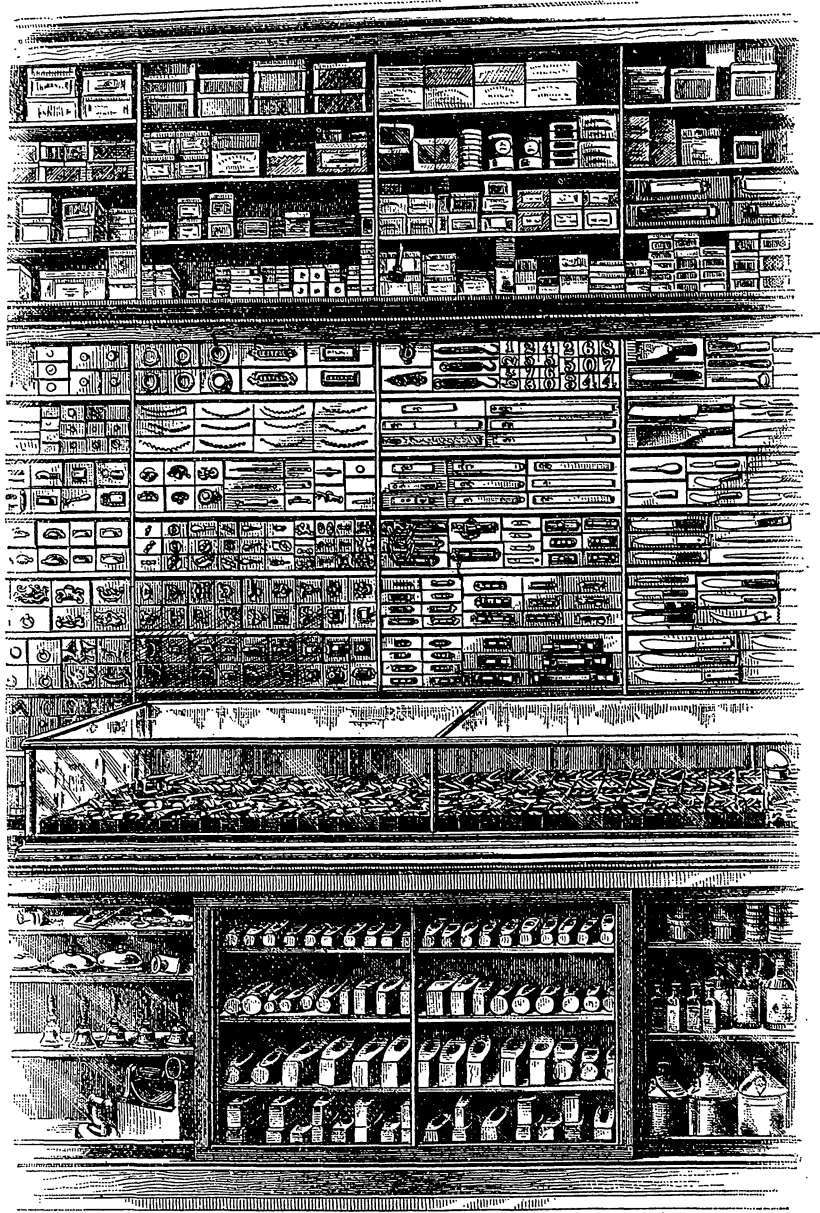


Fig. 843.—Counter, Showcase and Shelving.

lenient with all their shortcomings. We are also careful to lock the store door.

F. S. HUTCHINSON & Co., formerly of Long Island City, N. Y., manufacturers of the Paragon Self Retaining Dumb Waiters and hand and belt power Elevators, have been succeeded by the F. S. Hutchinson Company, of which F. S. Hutchinson is president, T. D. O'Connor secretary and J. C. O'Connor treasurer. The Messrs. O'Connor were formerly connected with the Hopkins & Dickinson Mfg. Company of Brooklyn. The main office of the F. S. Hutchinson Company is in the Aldrich Building, 32 Warren street, New York, with factory at Brooklyn.

interior arrangement of the store, which has resulted in many excellent and novel features. An idea of the general arrangement of the shelving and counters may be obtained from Fig. 843. The shelving part way to the ceiling is supplied with interchangeable sample boxes, so that boxes may be moved from one shelf to any other shelf in the store and fit. Above the sample boxes the shelving is devoted to full packages of the goods kept in the boxes below. The arrangement of shelving for full packages extends all around the store. Traveling ladders are used for reaching goods on

the higher shelves, and the store is fitted with a cash carrier system. A large line of Cutlery is carried, the arrangement of which is shown in Figs. 843 and 844. The boxes for these goods were made to order, in uniform sizes, for Pocket Knives, Scissors, Shears and Razors. The boxes are covered with black cloth with blue plush tops, the tops being hinged to allow taking out the goods, and having a place to mark the price without removing the box from the showcase, as represented in Fig. 845. The boxes are made in length to correspond to

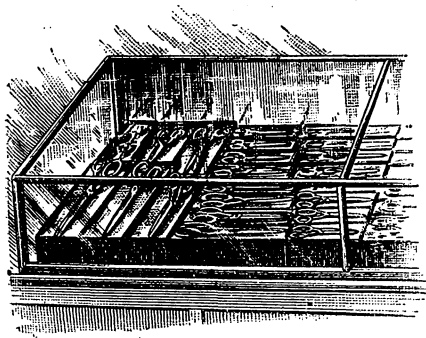


Fig. 844.—Arrangement of Cutlery Boxes.

the goods for which they are intended, and, as in Fig. 844, are arranged so as to leave no waste room in the cases. These boxes have been in use for more than a year and have proved very satisfactory.

The wall case Fig. 846 occupies the same position in another part of the store that the sample boxes do in Fig. 843. The case contains Saws, Hammers, Hatchets, &c., above which is kept the surplus stock of these goods in the

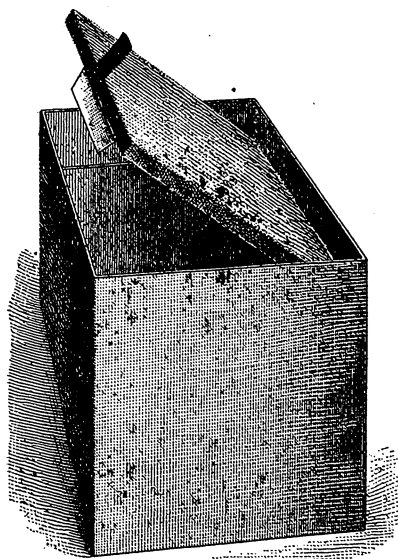


Fig. 845.—Cutlery Box.

original packages. All the counters have glass fronts to slide, back of which are shelves for goods, as in Figs. 843 and 846. The glass in front of the counters is 18 x 24 inches in size, and though they have been in use for

about three years not one of them has been even cracked. Before supplying the counters with glass fronts that part of the counter was always considered waste room. In addition to the goods shown in the counters, Squares, Wood and Iron Planes, &c..



Fig. 846.—Cases of Tools

are here kept. The back part of the counters is shelved to take the class of goods that belong to that particular section of the store.

Trade Items.

AS A SEASONABLE ARTICLE the trade will be interested in Linsley's Wire Cloth and Netting Price Book, published by F. J. Linsley, New Haven, Conn. The book is conveniently indexed, and contains tables giving the cost of Wire Cloth and netting from 12 to 72 inches in width by 1 to 150 inches in length, at prices per square foot from $\frac{3}{4}$ to 6 cents. The book is designed for use by those who sell Wire Cloth or Netting, and its utility has been shown in former seasons.

W. W. PRYOR & Co., 81 Chambers street, New York, have arranged to market the entire production of Magic Corkscrews manufactured by H. N. Knickerbocker, Troy, N. Y. We are advised a full line of samples can be seen at their office in this city, where stock will be kept and the trade supplied at factory prices.

EDWARD BECKETT, 29 Chambers street, New York, who succeeded Asline Ward as agent in this country for the Sheffield house of George Wostenholm & Son, manufacturers of Cutlery, went to Europe in the latter part of April on a trip combining both business and recreation. He is expected back in June.

THE NATIONAL KEG & BOX COMPANY, Birmingham, Conn., have established their New York headquarters at 2 $\frac{1}{2}$ Murray street. The business of this concern is the manufacture of locked corner wood Boxes, turned

drug and chemists' Boxes, plain and polished Handles and fancy hardwood Boxes. They also make a variety of similar goods, with nail, slide and wire hinge covers, also small square Mailing Cases. A large proportion of these goods are used by Hardwaremen for holding goods in shelves. Special sizes are made to order, and the point is made that a feature of their business is the export trade.

ALEXANDER COPPEL, manufacturer of Swords, Razors, Scissors and Pocket Cutlery, at Solingen, Germany, has removed his New York office from 62 to 94 Reade street, where he has now much more commodious quarters. He has taken the entire floor, one flight up, 75 x 25 feet in dimensions, and will hereafter carry a larger stock in this city than was feasible before. He is also sole agent for Stoll Bros.' Razors and Fred'k Ward & Co.'s English Cutlery. Hermann Coppel, who supervises the business in this country, will return some time in June next from Germany, where he went in December last.

A LARGE SPECIAL and unreserved sale of Enameled Ware is announced among our Special Notices by E. Bissell, Son & Co., to take place at their rooms, Tuesday and Wednesday, May 15 and 16, when by order of the St. Louis Stamping Company several thousand cases of Granite Ware seconds will be disposed of. A line of Baby Carriages will also be offered. Another sale is announced for May 22 and 23, at which a large assortment of Table Knives and Forks, Pocket Knives, Razors, Carvers, Butcher Knives, Scissors, Shears, &c., will be presented.

THE INDEPENDENT ELECTRIC COMPANY, Chicago, report that their Goodhue Combination Lock is finding favor as an export article, and that orders have already been received from Canada, Denmark and other countries. An illustration of the Lock is given in their advertisement which appears in this issue.

THE COBURN WHIP COMPANY'S branch, formerly at 90 Chambers street, New York, has been transferred to the offices and warerooms of the American Whip Company, 54-56 Warren street, this city, including stock, employees, &c. Their factory at Windsor, N. Y., will continue to run as heretofore. As it is all practically one interest, it was deemed unnecessary to maintain two depots in one city.

PATERSON, GOTTFRIED & HUNTER, 146-150 Centre street, New York, are sending out as an advertisement an imitation Circular Saw 3 inches in diameter, made of silvered cardboard with appropriate printing, fitted with a red cord passed through two holes in the center and tied at one end. The Saw is designed to revolve rapidly with a buzzing or whirling sound after the manner of a Circular Saw, as the string is alternately drawn taut and released.

THE CORPORATION NAME of Woolley, Baynon & Moore Company, 89 Reade street, New York, has been changed to the Woolley & Baynon Company. H. S. Woolley is president of the company, and C. A. Baynon secretary and treasurer.

J. FRED. WRIGHT, in the employ of Sargent & Co., New York, as an assistant in Mr. Ladd's department, noticing a prize competition in a printing trade journal recently, offered to writers of the best advertisements, entered the lists and succeeded in obtaining, we are told, 34 prizes out of a possible 48.

Bicycles in the Hardware Store.

BY SPIKES.

THE INCREASED TENDENCY of the retail Hardware trade to handle Bicycles has made itself apparent, both to the manufacturer and wholesale dealer, to the extent that the Hardwareman is now looked after to take the agencies of the most popular and leading makes. Hardwaremen should handle Bicycles, as there is good profit in them, and goods that pay from 30 to 50 per cent. should be kept in the Hardware line, and these goods chime in nicely with the class of semi-sporting goods kept in many Hardware stores; but many of the more conservative dealers do not take hold of them, for different reasons, and among them are these

OBJECTIONS.

1. Because they do not consider them staple goods, and staple goods are the Hardwareman's hobby.
2. Because it will take quite a sum of money to put in a fair line.
3. Because many of the makers and larger wholesale dealers, to introduce their wheels, will give an agency and the agent's discount to persons without commercial rating who only want a wheel for their own use. This practice has a tendency to discourage the trade from taking hold of the goods, as it demoralizes prices.

In answer to the

FIRST OBJECTION:

Bicycles have made for themselves a place among the staple goods, and in every town and village of the country they are found put to practical uses and so must be regarded as staple.

To the second objection I would say, invest a sum in proportion to your capital and with regard to the size of your territory and the competition you may have. Select a good line of wheels, looking out for quality as well as price, maintain your prices, look after the details, advertise, and you will soon have a trade established that will pay you well for the trouble.

The third objection is an old complaint and is the one that causes the dealer the most trouble. It is one of the conditions of trade that we have to contend with in handling specialties of most any kind. We, however, have the advantage of being on the ground and of a personal acquaintance with most of our customers, and using that as a principal argument in favor of buying at home. Among other reasons are these: 1. That you can see the wheel and not buy a "pig in a bag;" and again, if there should be a break, either through fault of the wheel or through accident, the dealer can get the repairs or send and get the wheel repaired quicker and more cheaply than the individual, on account of having the advantages of a commercial rating and getting the trade discounts, and on warranted goods the rider can look to the local dealer and not be obliged to resort to an extended cor-

respondence to establish his claims with the makers.

These are among the arguments that any salesman can use, and these, well used and backed by a reliable and popular house with good goods, will command the desirable trade.

DISAGREEABLE COMPETITION.

There is an unpleasant class of competition caused by makers and dealers who put out a second-class article at a second-class price, claiming it to be strictly first-class quality, and again by makers who have an old stock on hand that they dispose of to a large dealer who is after the retail trade; if those dealers would state the whole truth it would not be so bad, but they will advertise the "Get-there" wheel, strictly high grade, at a price lower than you are paying for the 1894 pattern of the same wheel, but forget to state that their wheel is an 1892 or '93 pattern. The result is that while you have advertised and shown up the "Get-there" they have sold one or two, and then your customers will see the difference and you will no doubt sell the balance, and while one or two wheels may be a small item in most places, yet with the country dealer who sells from five to fifteen in the season it is a large item. This is a kind of competition met with in the Bicycle line more than in others on account of the rapid improvements in the last three or four years. To meet and

OVERCOME THIS COMPETITION

get, in addition to your own line, one of the old style "Get-there" wheels, put the price where they cannot afford to think of sending for one, and then use it to sell your regular line by, as you can contrast the good points of your new style with the defects of the old style, and you will find that both old and young America will keep up to date by buying the latest. After the old one has passed its day of usefulness to sell the others by you can easily get cost if not a profit on it.

ASSORTMENT.

This will depend entirely on class of trade, size of territory and the amount of competition, if any. If in a place with little or no competition, secure the agency of one good high grade wheel, and always have a sample at least on your floor. Push that wheel, ride it, talk about it and swear by it. Have the wheel that you believe yourself is the best, and then you can make others believe the same. Have a medium priced wheel, and a cheap boys' and girls' wheel. The demand for boys' and girls' wheels is increasing, and it will not be long before they will want a full size high grade wheel.

Post yourself in regard to the prices, good and bad points of all the other wheels you can, so as to be able to show your wheel by comparison if necessary with any other wheel your customer may have been impressed with before seeing yours, as there are times when it is advisable to be able to talk about other wheels, but in most cases you can

find good points enough about your own to talk about, and do not advertise some other wheel by frequent reference to it if you expect to sell your own.

When you get hold of a

PROSPECTIVE BUYER

sell him the wheel you have if possible, but if you cannot and he will have some other kind, sell him that one and get it for him. Make it a point to have every wheel that comes into your territory go through your hands, even if you do not make quite as much on it as on your regular line, for by so doing you have gained a point toward keeping another agent out, and if the wheel thus procured should prove a desirable one others wanting it will be referred to you.

In places where there is already competition you will find it best to stick more closely to your own line—i. e., to the one high grade wheel you represent—and put your whole effort into that one wheel, and each wheel you put out will be an advertisement to your agency and to your wheel.

TO STIMULATE SALES,

talk Cycle, advertise Cycle and ride a Cycle, and if you do not know how learn, and take a public place to learn in. The more of a show you make of yourself the more it will advertise yourself and your business. One, at least, of the firm or the Cycle salesman should be a rider. It is not necessary to be a record breaker, but for business, if nothing more, go out with the boys occasionally, take an interest in them and their runs, make the riders your friends and they will be your best advertisers. Take the Cycle papers, have them in your Cycle sales-room, and as far as you can make that the headquarters for, and yourself the local authority for, Cycle information of all kinds. Get up a local club, organize local races and, above all, get the ladies interested, and you can count on selling five gentlemen's wheels to every ladies' wheel that you sell.

SUNDRIES AND REPAIRS.

Keep a fair line of sundries, such as Lanterns, Bells, Carriers, Repair Outfits, &c.; you will find a constant demand for them and they bring a good profit. Put in a club or foot pump for the free use of your patrons; it is quite an inducement for riders to buy their wheels and supplies of you.

For the large majority of dealers who sell a limited number of wheels a repair department is best dispensed with. Arrange with the local machine or repair shop to do your work at a low price, as there will be a few repairs that it will be best for you to do to retain the best will of your customers, but if you have no shop or place to do the work, in most cases they will go and get it done themselves and save you the trouble and expense of doing work and furnishing pieces that you could not charge for. As all the standard wheels are warranted the larger repairs caused by defects will be

done by the makers under the terms of the warranty. These, of course, are not many, but still some occur.

EXTRAS.

Keep on hand a small line of extras for the wheels you sell and make that a point in selling that if they buy of you, any little thing that wears out or gets lost can be replaced without the time or expense of sending off and getting it. At times it takes weeks to get some little extra, and to be able to get them quickly of the local agent is a great advantage.

To any one interested in outdoor sports especially they will find the Bicycle business pleasant and lucrative.

Mammoth Band Saws.

FIVE of the largest Band Saws ever made were recently shipped to the Pacific Coast by Henry Disston & Sons of Philadelphia. These Saws are 56 feet in length, 14 inches wide, 13 gauge thick, with teeth $1\frac{3}{4}$ inches from point to point; each Saw weighed 248 pounds when finished. The ingots from which these Saws were made weighed 385 pounds each, and were cast and rolled at the steel works of the Disston Company; the steel being this firm's aluminum crucible steel, from which all their large Band Saws are now made.

In 1885 a Band Saw 8 inches wide was considered a wide Saw, and in fact it was at that time the maximum width in use, 6 inches being then the most popular width for log Band Saws, but of late years the demand for band mills of greater capacity has induced mill machinery builders to not only improve their mills in general design, but to make all parts heavier and stronger, and with wheels of sufficient force to carry a Saw 12 inches wide. Such gains in the capacity of the mills have been made by these changes, the natural improvement in the quality of the steel and workmanship on the Saws, that now 12-inch Saws are most popular.

It has been thoroughly demonstrated that the wider Saws will stand a heavier feed and make truer lumber, but at the same time it must be understood that the wider a Saw is, the more skill and work required to level up the plate and adjust the tension, though when this work is once properly done on a wide Saw it lasts longer than the same work done on narrower Saws. In either case the highest grade of skill obtainable is the best and cheapest.

In addition to standing a greater feed and making truer lumber, a wide Band Saw can be run with a little less tension than a narrower one, consequently having more traction surface it will perform its work with less proportionate tensile strain, which in turn means less crystallization by pounding or impact on the wheels, thereby reducing these two destructive elements very materially and greatly increasing the life of the Saw.

In connection with this matter, it is worthy of note that Henry Disston & Sons manufacture their own steel, and to this one point they attribute a large portion of their success, for steel is the foundation of good Saws, and by having the specialty of making saw steel under their direct notice and supervision, they are enabled to turn out a quality that is particularly adapted to the work and strains to which a Saw is subject. They have also many patent processes in manufacturing, which with their unexcelled facilities and under the supervision of the highest mechanical skill, enable them to sus-

tain the reputation established for their goods in all parts of the world.

Price-Lists, Circulars, &c.

E. D. CLAPP MFG. COMPANY, Auburn, N. Y.: Carriage Forgings. Under date May, 1894, an illustrated catalogue and price-list shows an extensive line of Carriage Forgings. The company also make many special forgings for carriage, bicycle, typewriter, electric motor, agricultural and other purposes. The company state that they have excellent facilities for this class of work, and are prepared to name favorable prices promptly upon receipt of sample patterns of wood or metal or drawings to scale.

THE CINCINNATI MFG. COMPANY, Cincinnati, Ohio: Wire Goods. A postal card suggesting to the trade to watch their buying closely on such goods as Corn Poppers, Fly Traps, Sifters, Horse and Dog Muzzles, Cages, Riddles, Sand Screens, Wire Cloth, Poultry Netting, &c.

L. W. FERDINAND & Co., Boston, Mass.: Heavy and Ship Chandlery Hardware. A catalogue of 226 pages illustrates and describes, with prices, the above goods, also Tackle Blocks, Cordage, Ship Chandlery, &c. In addition, the company are agents for the Shelton Brass Hardware Company.

ROBERT C. REEVES COMPANY, 185-187 Water street, New York: Agricultural and Horticultural Supplies. A descriptive catalogue is devoted to Implements, Machinery, Garden, Field and Flower Seeds and Contractors' Supplies.

PHILADELPHIA SCOOP COMPANY, Philadelphia, Pa.: Scoops, Acto Heater, &c. Circulars illustrate and describe these goods with prices. The Heater is designed to be used over lamps or gas jets without interfering with the light, to take dampness and chill from rooms, and can be carried in a trunk.

LEE-CLARK-ANDRESEN HARDWARE COMPANY, Omaha, Neb.: Seasonable Hardware Specialties. A price current containing 24 pages illustrates Refrigerators, Ice Picks, Chippers and Shredders, Lemon Squeezers, Water Coolers, Mincing Knives, Cherry Stoners, Lawn Mowers, Scythes, Lawn Sprinklers, Screen Doors, Spring Hinges, Toilet Clippers, &c.

SABIN MACHINE COMPANY, Montpelier, Vt.: Hendry's Anti-Rattler Thill Coupling Spring. The device is a metal Spring adapted to any coupling, designed to hold the shaft in place and to prevent rattling.

A. LESCHEN & SONS ROPE COMPANY, St. Louis, Mo.: Wire Rope and Fittings of every description. A standard price-list of 64 pages illustrates Wire Rope, Fasteners, Blocks, Shears, &c.

It Is Reported—

California.

That Wakerley Bros. of NAPA have opened a new store at CALISTOGA.

That Baker & Hamilton of SAN FRANCISCO have opened a branch establishment at LOS ANGELES. It will be under the management of William H. White. Mr. White was formerly the manager for Knapp, Burrell & Co. of SEATTLE, Wash., and is considered especially well informed in the Implement line. Mr. White will have charge through the LOS ANGELES house of all the business of the firm south of BAKERSFIELD, and including besides SOUTHERN CALIFORNIA, NEW MEXICO and ARIZONA.

Illinois.

That M. E. Smith of JANESVILLE, Wis., has opened a new Hardware store at PEACATONICA.

That the Lowell Hardware Company, JANESVILLE, Wis., have purchased the stock of Hardware of William Trigg & Co., AURORA, and will close it out.

That August Bohlander has opened his new Hardware store at MELROSE PARK.

Indiana.

That A. W. Beal has sold his Hardware store at SALEM to W. A. Ratts, who will continue the business.

Iowa.

That burglars broke into D. B. Brunkskill's Hardware store at HAWARDEN a short time since and stole about \$300 worth of Fire Arms, Razors, &c.

That Stebbins Bros., BONAPARTE, have sold their stock and fixtures to G. A. Van der Meulen of Pella, the consideration being \$23,000.

That Pitzer & Yeager, CANTRIL, have added a large Implement room to their Hardware store.

That E. S. Welch is now the sole owner of the Hardware store formerly conducted by Welch & Lazenby, OTTUMWA.

That James Ferman has disposed of his interest in the firm of Ferman & Kingsbury, CRESTON, to Mr. Kingsbury, who will continue the business under his own name. Mr. Ferman's withdrawal from the firm is owing to ill health.

That W. H. Stiles, GARDEN GROVE, has sold his stock of Hardware to S. Scott, who will conduct the business under the name of S. Scott & Son.

That Charles F. Beaman has established himself in the Hardware business at ATLANTIC.

That B. A. Geiser has entered the Hardware business at UNION.

Kansas.

That A. Sellers has bought out the interest of his partner, S. C. Wright, in the Hardware business, at MCPHERSON. Mr. Wright expects to engage in the Hardware business at SANTA ANNA, Cal., having arranged for the purchase of a stock of goods at that point.

That H. C. Stenger will remove his Hardware business, at HERRINGTON, to new quarters.

That Baxter & Fisher's Hardware store, at REPUBLIC CITY, was burglarized on the 26th ult.

That the Van Zandt Hardware & Implement Company, HUTCHINSON, have been incorporated. The capital stock is \$25,000. The directors are J. R. Van Zandt, W. G. Van Zandt, A. Van Zandt, F. G. Delano and W. Benefiel.

Massachusetts.

That Cunningham & Co.'s Hardware store, at MILLBURY, was entirely destroyed by fire on the 7th inst.

Michigan.

That Henry Weber's Hardware store, at WEST BAY CITY, was robbed on the 29th ult. of \$50 worth of goods.

That Thomas Knight has sold his interest in the Hardware store of Knight & Decker, GRAND HAVEN, to Isaac Decker, who will continue the business.

That T. D. Roy has purchased the interest of William Coltson in the firm of Roy & Coltson, KINGSTON.

Minnesota.

That the style of the C. C. Clement Hardware Company, WINONA, has been changed to that of the Winona Hardware Company. The business will be continued at the old stand as heretofore.

New Hampshire.

That a new Hardware store will soon be opened by J. A. Hodgdon of BERLIN.

New York.

That Farr Bros.' Hardware store at CANASTOTA was robbed of \$150 worth of goods on the 22d ult.

That J. L. Wilder, SHORTSVILLE, has disposed of his Hardware business to Pulver, Jessup & Co. of STANLEY. Mr. Wilder will engage in the produce business.

Ohio.

That the Gloucester Hardware Company, GLOUSTER, has been incorporated, with a capital stock of \$10,000.

That Moon & Snyder's Hardware store at BLANCHETER was burglarized for the fourth time a few days since; \$150 worth of goods were taken.

That E. W. Eoderick has removed his stock of Hardware, Cutlery, Tinware, &c., from AGOSTA to UNIOPOLIS, where he will hereafter be located.

That C. Smith of OBERLIN has completed arrangements to remove to BELLEVUE, where he will open a Hardware store. Mr. Smith expects to commence business about June 1. He was formerly in the Hardware business at VERMILION.

That Hugh McGugan, who recently sold his Hardware and grocery store at CHARDON to King Bros., has purchased the Hardware store of Mrs. Daniels at MADISON.

Pennsylvania.

That the Hardware store of O. C. Dickey & Son, CONNEAUTVILLE, was visited by thieves on the 24th ult., who carried off a large number of Pocket Knives and other articles.

South Dakota.

That T. C. De Jean has purchased the Hardware stock of A. D. Dougan of PLANKINGTON.

Texas.

That burglars broke into the store of Shortridge & Muckleroy, TERRELL, on the night of the 29th ult., and carried off a considerable quantity of goods.

That about June 1 J. A. Myers will open a general line of Hardware, Crockery, Paints, Oils, &c., in BRYAN.

Vermont.

That John H. Stewart of MIDDLEBURY has bought a half interest in the Hardware business of Allan Calhoun.

Virginia.

That in a large fire at WINCHESTER, April 29, the Hardware and Stove store of Solenberger & Stouffer was destroyed, the loss being \$12,000; partly insured. The fire was of incendiary origin.

Washington.

That Cockran Bros. will soon open a Hardware store at OCATA.

That the loss by fire suffered by Scott Bros. & Co., OAKESDALE, a short time since was less than \$350. The report that their store was destroyed was without foundation, a small warehouse only having been burned.

Wisconsin.

That John Dalton and E. O. Gilfillan of LA CROSSE have bought a Hardware store in BLAIRE.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—The situation in the market for Dry Lead is no better than it was a week ago. This is about the best that can be said. Competition has not abated in any event, and the fact remains that previous lowest quotations are made as an incentive to buyers, not only by the smaller outside producers but by the combined cor-

rodgers. Lead in Oil has met with somewhat better sale, but the movement is only fair for the season and not sufficient to check the irregularity in prices and terms that has prevailed for some time past. Reports come from interior and distant markets of even sharper competition there, with some indication that rivalry is particularly keen in San Francisco and intermediate territory, and not abated in territory contiguous to St. Louis and Chicago. In the New York and neighboring markets, however, prices have undergone no positive change.

Red Lead.—Routine orders reaching merely fair proportions are about all that have been received in this quarter, and the demand is commonplace in the extreme. This applies alike to domestic and foreign brands. In prices no radical change has taken place, but the general market shows rather weak tone, and list quotations are above the actual trading basis where deals involve anything in the nature of wholesale quantities.

Litharge.—Orders from large consumers of the lower grades of Litharge have fallen off, since requirements for some time ahead are well discounted by recent purchases. For the finer grades there is nothing more than routine demand. Sellers' prices have undergone no positive change, but the market is, generally speaking, soft as well as rather dull.

Orange Mineral.—The demand for imported stock is moderate, but recent arrivals seem to have been well absorbed, and with light stocks on spot prices are quite well maintained, since there is no really heavy offering for forward shipment. Domestic stock is meeting with limited sale and manufacturers' prices remain unchanged.

Zincs.—A quiet and uneventful market for American Oxide has been experienced. New orders were not only small, as a rule, but hardly up to the average numerically. Prices are rather weak, more particularly on the low grades, with 3½¢ said to have been accepted, in some instances, against the popular quotation of 3¾¢. The better grades bring 4¢ @ 4½¢ in a jobbing way. Foreign brands are moving slowly, and the business passing is chiefly at old list prices.

Colors, &c.—The decline in prices of Carmine referred to last week has failed to stimulate business, and the market is weak, with competition quite lively. In some instances \$2 for bulk has been shaded. American Quicksilver Vermilion is higher, with 47¢ now quoted for bulk and 48¢ for bags by most manufacturers. In the other lines of Dry Colors only ordinary fluctuation has taken place and business throughout is still of extremely conservative character. In some lines of Oil Colors and Ready Mixed Paints there is quite a good business, but the spring season movement is still rather backward. No change has taken place in the market for Block Chalk, Whiting or Clays. Business in the several lines is only fair.

Oils and Turpentine.

Linseed Oil.—Out of town brands have been sold in this and neighboring markets at 47¢. Rumor has it that a lower price was accepted in remote instances for deliveries running two or three months ahead. City crushers claim to have adhered to their old basis of 52¢, less usual allowance for packages, and report a very fair volume of business also. There is still somewhat lively outside competition, however, and not a little reason for the statement that weakness below the surface of the market has not been eliminated. Oil made from Calcutta Seed is still held at a premium of 6¢, or at 58¢ for raw.

Cotton Seed Oils.—Moderate sales of crude have been made at 29¢ @ 30¢, indicating a steady tone to the market in the face of rather slow business and spiritless demand in this quarter. Prime Summer Yellow has been sold at 32¢ @ 33¢. Choice quality went at 1¢ @ 2¢ better. The other grades of refined went at corresponding prices. Business has been rather slow, however, and the market is momentarily spiritless, with hardly any export call and barely average home trade demand.

Lard Oil.—Prices have dropped under the weight of weakness in the market for raw material and rather poor demand for Oil. Where round lots were involved 61¢ @ 62¢ have been the top prices for either city or out of town brands. In some instances 62¢ @ 63¢ were accepted for single barrels. The market is flat at this writing, with rather weak undertone.

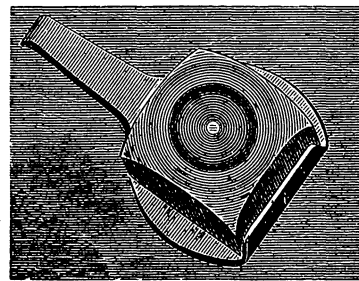
Fish Oils.—Crude Menhaden Oils are unchanged in price, and the market is somewhat uncertain. The catch of fish thus far this season has been very good, and the run of orders light. There has been no new movement in crude Sperm or Whale Oils. The pressed and bleached products have moved out in jobbing way at former prices, but rather slowly.

Miscellaneous.—Common Olive Oil in barrels is still rather weak, with business in spot stock at 56¢ @ 58¢ reported and still lower figures rumored. Business is slow. Coconut Oils have just about held their own in price, but are selling in routine way only.

Spirits Turpentine.—Business has been hardly up to the average and the demand has shown less spirit. Stocks have not accumulated to any great extent, yet sufficiently to carry prices down to 29¢ @ 29¼¢ for regular and 29½¢ @ 29¾¢ for machine barrels.

The Porter Nut Lock and Washer.

An illustration is herewith given of the Porter patent combination nut lock and washer. It is offered by the manufacturers to the trade as a cheap, simple and effective device for locking nuts

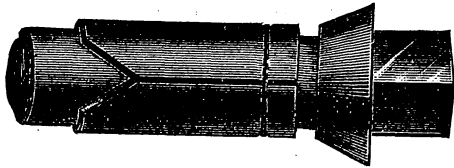


The Porter Nut Lock and Washer.

securely in place. The washer, as shown in the cut, has an extension which is pointed and bent so that it can be driven into the wood. On the opposite end of the washer a lip is turned up against the side of the nut, which prevents it from turning after the point has been driven down. As will readily be seen, this device is adapted to nearly every purpose for which bolts are used. It is applied as readily as an ordinary washer. Nor does it prevent the nut from being unscrewed if for any reason the bolt must be loosened, as all that is necessary is to raise the point of the washer out of the wood, when the nut can be turned. It is manufactured by the Porter Nut Lock Company of Chicago, for whom Horton, Gilmore, McWilliams & Co., 172 to 176 Lake street, Chicago, are sales agents.

Prison Expansion Bolt.

Steward & Romaine Mfg. Company, 123 North Sixth street, Philadelphia, have added to their line of extension bolts the one shown in the accompanying cut. The feature of this bolt is a countersunk head with a square projection, which allows the square part of the head to be cut off after the work to be erected is in position and fastened up. The object in cutting off the square projection is to leave the bolt with a plain surface that cannot be removed by prisoners or insane persons with wrench or screw driver. The

*Prison Expansion Bolt.*

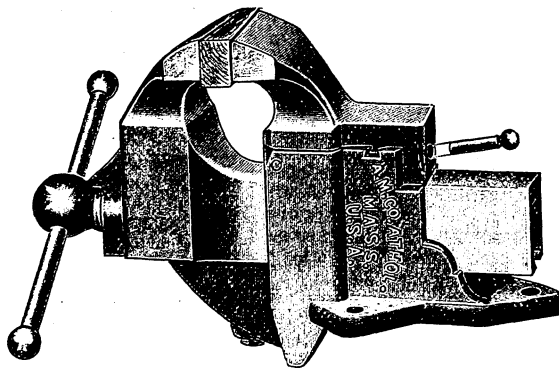
bolt is designed for use on door and window frames, window guards, &c., of prisons, insane asylums and other institutions.

Swivel Jaw Standard Vises.

Athol Machine Company, Athol, Mass., have added the vises illustrated herewith to their line of Simpson and Standard vises. The vises have a self adjusting back jaw, which automatically adjusts itself so as to hold wedge shaped pieces. The top part of the swivel jaw is provided with a rib on its under side which fits into a corresponding slot in the lower half, forming a bearing to hold the piece in place when the vise is in use. The top piece also extends back so as to cover the lower part to prevent dirt from working into the swivel jaw and clogging it. The pin holding the swivel jaw in place is located at the back, to be out of the way of the workman and to leave the

the pressure is applied the action of the bar of the front jaw bearing against the swivel jaw forces the jaw squarely

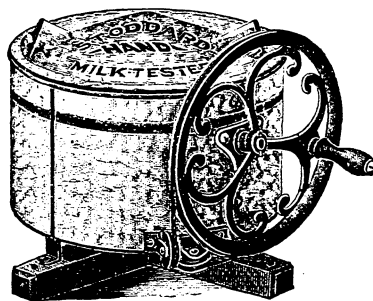
value of milk. The tester is intended particularly for use by private dairymen who manufacture their own butter as

*Fig. 1.—Bench Vise with Swivel Jaw.*

against the work, thus holding firmly whatever may be between the jaws. These goods are made in both styles of Simpson and Standard vises.

Stoddard's Hand Milk Tester.

The cut here shown represents a hand milk tester offered by Mosely &

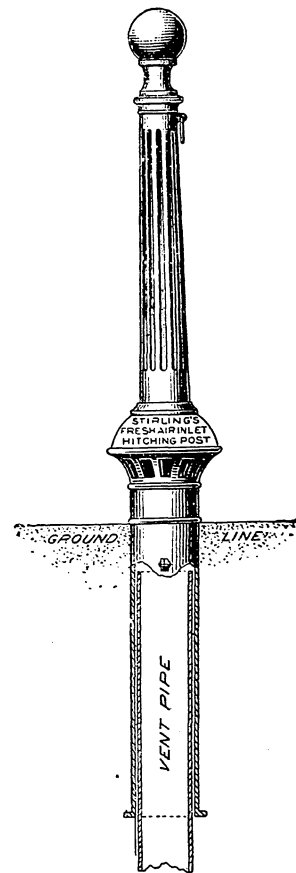
*Stoddard's Hand Milk Tester.*

Stoddard Mfg. Company, Rutland, Vt. The manufacturers claim that the tester

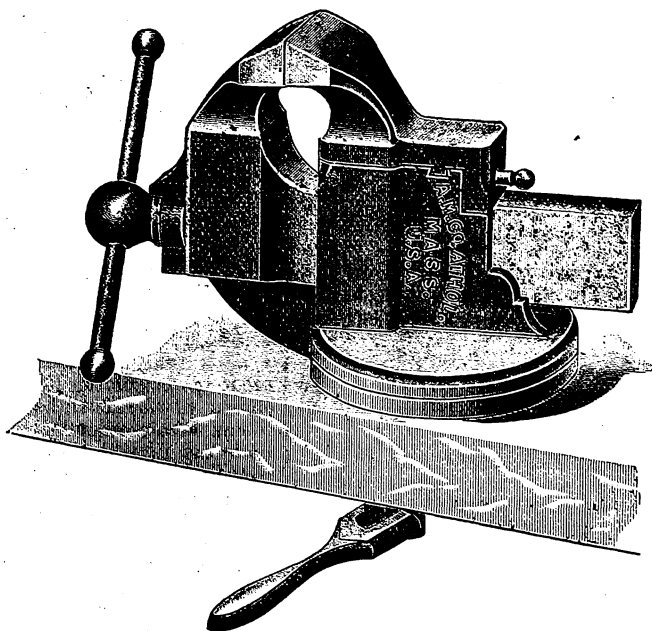
an aid in the discriminate weeding out of poor and unprofitable cows.

Fresh Air Inlet and Hitching Post.

The accompanying illustration shows a novel combination of fresh air inlet and hitching post made by Edward M. Stirling, 85 Market street, Newark,

*Fresh Air Inlet and Hitching Post.*

N. J. It consists, as shown, of an ordinary hitching post, with perforations near the bottom connecting with the inner pipe that forms the lower end of the post, and fits over the top of the fresh air inlet from the house drain at the foot of the soil and waste pipe system on the house side of the trap. It is particularly mentioned by the manufacturer that this inlet is not liable to be clogged by dirt and become useless, and does not present a conspicuous hole to be filled up by the mischievous small boy.

*Fig. 2.—Swivel Vise with Swivel Jaw.*

top of the vise free for use, as with ordinary vises. The rear end of the swivel jaw rests across the vise on a level with the top of the bar to the front jaw, so that, it is explained, when

combines strength and simplicity, and that in operation the belt will not slip at points where power is applied. The device embodies the Babcock method, and is designed to determine the butter

Columbian Sprinklers.

Columbian Hose Nozzle Company, Des Moines, Iowa, are offering the nozzles as shown by the accompanying

scrubber, Fig. 2, is a squeegee and scrubber combined, composed, it is stated, of a Para rubber scraper, $\frac{3}{8}$ inch thick, and rice root brush of the best quality. It is adapted to the use

holes or main channels. In operation the valve is forced automatically by the

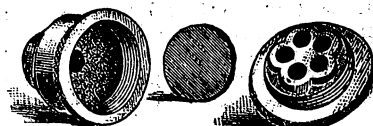


Fig. 2.—Cup, Valve and Cap.

water pressure against the bottom of the cap, closing the entrance to the

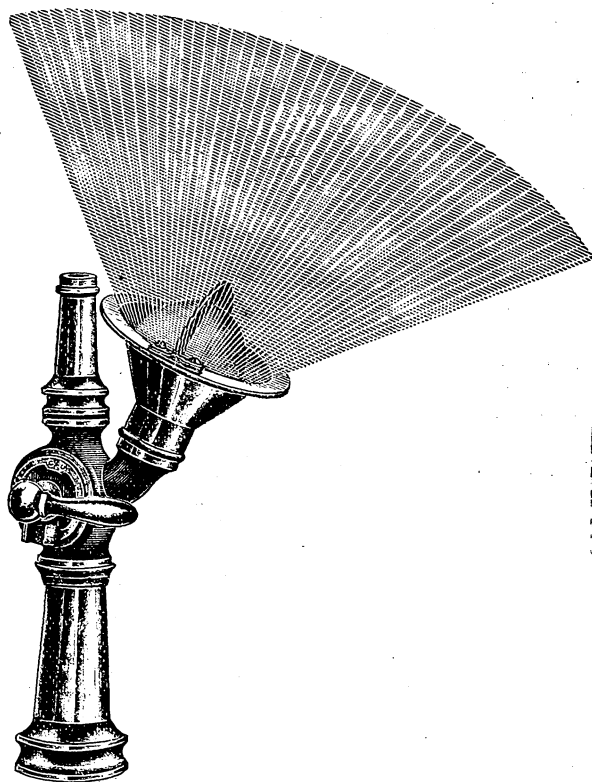


Fig. 1.—Columbian Fire Nozzle.

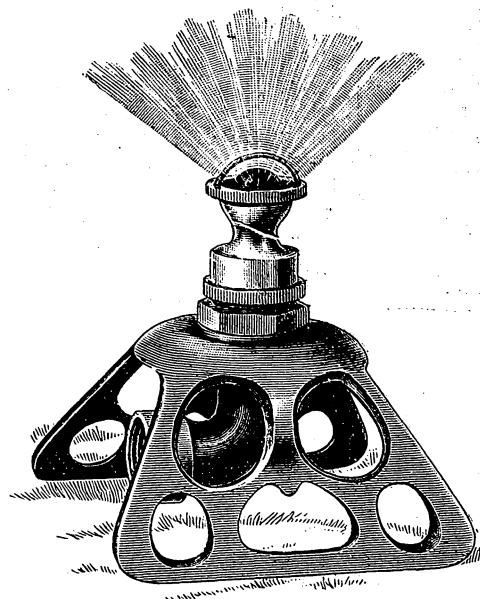


Fig. 2.—Columbian Lawn Sprinkler.

cuts. The nozzle shown in Fig. 1 is arranged so as to throw a solid stream or a spray. The manufacturers claim that the spray furnishes protection to the fireman, enabling him to enter a building that may be full of smoke and heat by turning on the spray, which is so heavy that it drives away all smoke and heat, thereby making it easy to locate a fire and fight it at close range. The lawn sprinkler, Fig. 2, throws a spray only, the balls in both devices being prevented from losing out by a metal strap over them.

Squeegee and Scrubber.

The Cleveland Novelty Company, Cleveland, Ohio, are offering the squeegee and scrubber, of which illustrations are here shown. The Perfection squeegee, Fig. 1, has interchangeable parts, with malleable shank and decorated

of grocers, butchers and stores of all kinds.

Hood's Cluster Spray Nozzle.

The Puyallup Hardware Company, Puyallup, Wash., are introducing a

main channels, which forces the water through the lateral channels, to issue in the form of spray or fog from the outer openings. By removing the valve the nozzle may be converted into a sprinkler, the water passing directly through the main channels and issuing

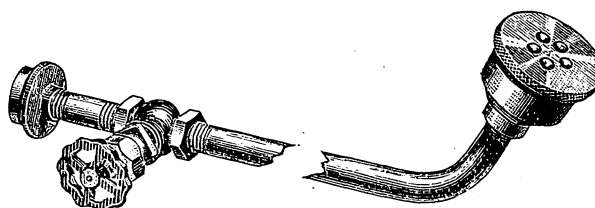


Fig. 1.—Hood's Cluster Spray Nozzle.

spray nozzle, as illustrated in the accompanying cuts. In Fig. 1 the nozzle is shown attached to the pipe extension,

from the outlets in fine streams. The device is designed for the use of fruit and hop growers, and for spraying plants, shrubs, trees, &c., with liquid insect destroyer. The manufacturers claim that the nozzle is strong, durable, compact and light; that it has no springs or complicated mechanism to get out of order; that it has no outside projections to catch on vines or branches; that it can be readily and easily cleaned, and that having five outlets it will do five times the work that a one-outlet nozzle will.

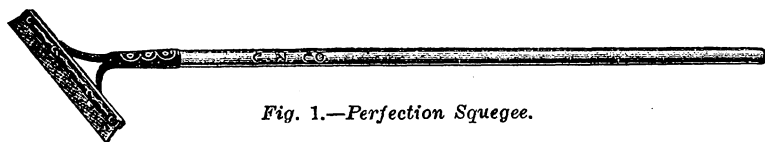


Fig. 1.—Perfection Squeegee.

steel side strips. It is remarked that the rubbers are made of the best Para rubber, $\frac{1}{4}$ inch thick; that when worn

while the three parts forming the nozzle are shown in Fig. 2. The valve, the center of the three parts in Fig. 2, is

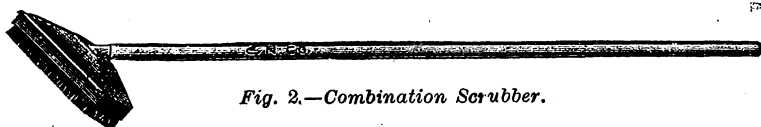


Fig. 2.—Combination Scrubber.

out new rubbers can be easily inserted, and that the device is thoroughly high grade. The Combination

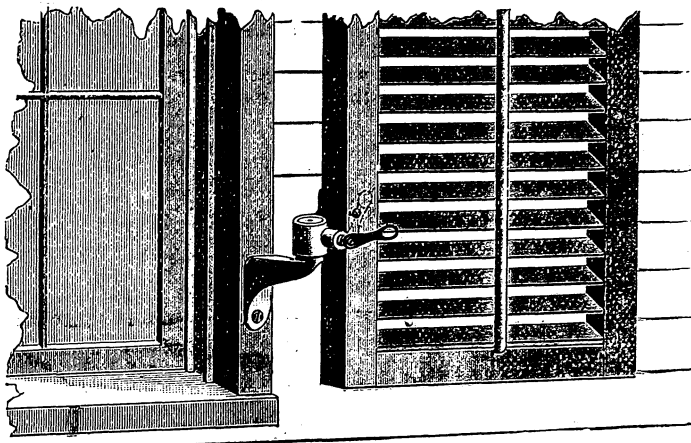
is placed in the cup, after which the cup is screwed on. In the cap there are spray channels opening laterally into the

THE AMERICAN AXE & TOOL COMPANY, formerly in the Stewart Building, Broadway and Chambers street, New York, are now comfortably installed in their suit of seven rooms on the fifth floor of the Postal Telegraph Building, now nearly completed, at Broadway and Murray street. From their offices there is a fine view of the harbor and the North River.

Yankee Blind Hinge.

Edward G. Shepard, 142 Chambers street, as New York sales agent, is offering the blind hinge here shown, which is put on the market by McFarland Mfg. Company, Boston. It is made of malleable iron, and is provided with

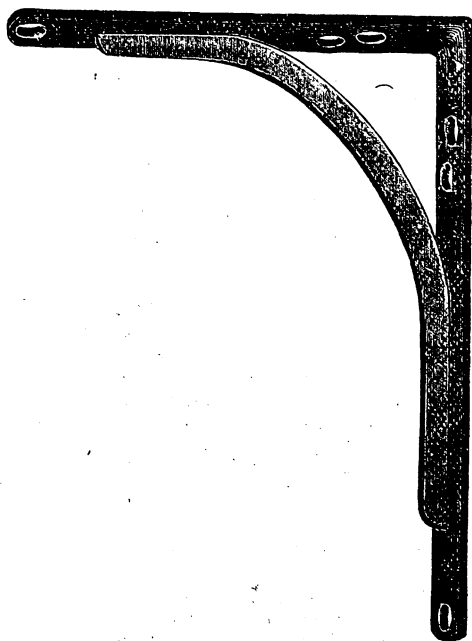
urers claim that it is stronger than a cast iron bracket, and cannot be broken while being placed in position or in transportation, that it is always level, that it is neat in appearance and of light weight. In this connection they mention that a freight allowance of 25 or 30 cents per 100 pounds on this

*Yankee Blind Hinge.*

an attachment for holding the blind in any position. The handle or crank shown on the inside of the blind screws into the eye of the hinge, and when tightened it forces against the other part of the hinge. It is claimed that the hinge is durable, secure and simple; that it obviates the necessity of staples or hooks; that it fastens the blind in any position, open or shut; that it is easy to operate; that it prevents the blind slamming; that it prevents winds unhinging blinds, and that it may be applied to old or new blinds. The hinges are made to fit all styles of wood and brick buildings, and are packed in boxes of 10, 50 and 100 sets, including lock hinge, upper hinge and screws complete.

Wrought Steel Shelf Bracket.

In the accompanying cut is shown a wrought steel shelf bracket introduced by Lindsay & McCutcheon, Allegheny,

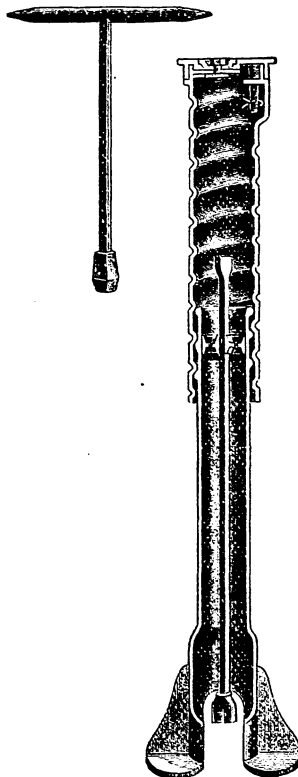
*Wrought Steel Shelf Bracket.*

Pa. It is made of steel, the brace having lugs which are mortised into and riveted to the back and top, the whole being finished in Japan. The manufact-

bracket is equivalent to 50 or 60 cents on cast iron brackets.

National Service Box.

Ette & Henger Mfg. Company, St. Louis, Mo., are offering service boxes as shown herewith. The special feature

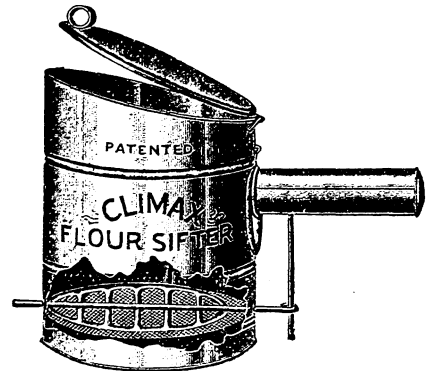
*National Service Box.*

is a stationary rod inside the box, attached to the service cock, and extending to within 12 or 18 inches of the surface. The combination key shown at the left of the box is adapted to opening the cover and also to fit on the end of the stationary rod, the same key serving both purposes. The manufacturers refer to the greater convenience of the short key as compared with the old style of long key for turning off or on, and state this device for stationary

rod can be used in connection with all lengths and sizes of service boxes made by them.

The Climax Sifter.

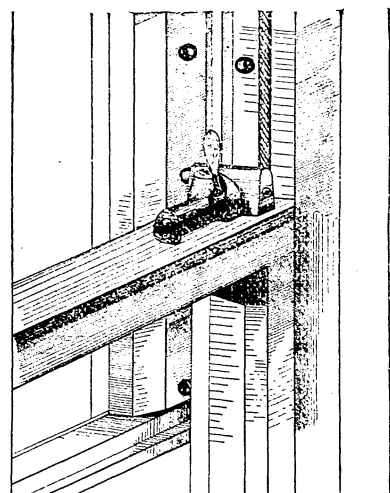
The accompanying cut shows a broken view of the Climax flour sifter, made by the Climax Mfg. Company, 415 Cuyahoga Building, Cleveland, Ohio. It is especially adapted to sift flour and is about 6½ inches high and 5 inches in diameter. The handle, it will be noticed, is so arranged that by

*The Climax Sifter.*

a slight shaking motion the sifter is put into operation. It is worked entirely with one hand and by an easy motion.

The Chaplin Window Lock.

The accompanying cut represents a window lock put on the market by McFarland Mfg. Company, Boston, for whom Edward G. Shepard, 142 Chambers street, is agent. The device consists of a frame or case to be secured to the meeting rail of the lower sash of a window at the right hand side. The case is provided with a cam lever, moving two bolts endwise at right angles to each other. Brass thimbles are placed in the upper sash, also in the pulley stile opposite each other, into which the bolts are thrown at the same time by moving

*The Chaplin Window Lock.*

the lever to an upright position, thus locking both sashes. A flat steel key accompanies the lock, for locking the bolts so that the lever cannot be turned to unlock the window. The device is designed to give protection against thieves and to secure ventilation with safety. The lock is especially adapted to dwellings, hotels, apartment houses,

insane asylums, or for any buildings where fire escapes or verandas connect two or more rooms.

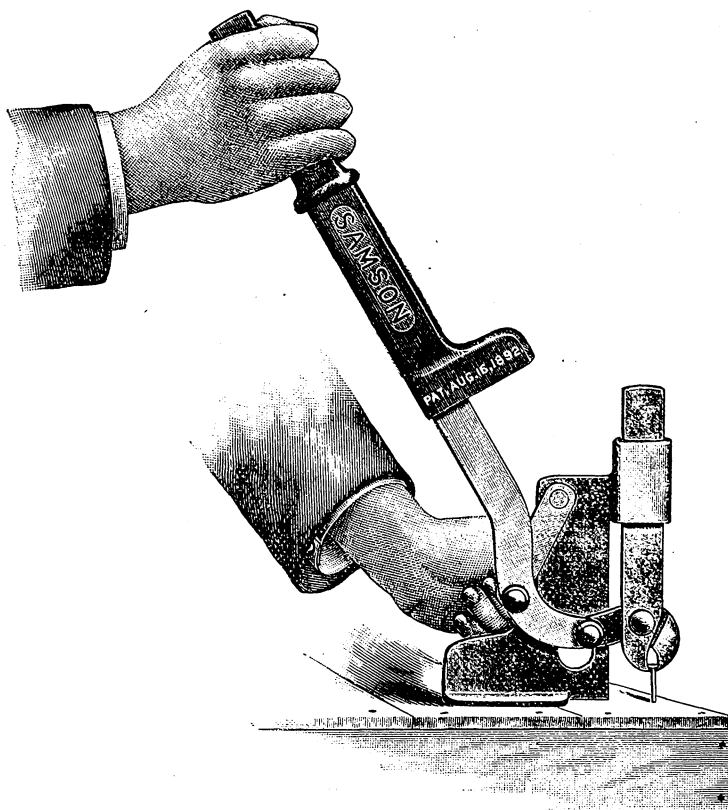
Samson Nail Puller and Box Opener.

Woodrough, Mansfield & Co., 36 Pearl street, Boston, are introducing the nail puller illustrated herewith. The handle and standard are made of malleable iron and the jaws are of steel. There are no springs used in its construction, and all parts are interchangeable. The manufacturers claim that it pulls nails straight, leaving them as

with side handles. The strainer is removable and is designed for taking the vegetables from the pot. The point is made that the strainer is especially adapted to asparagus, as it keeps the bunches in order, which adds to their appearance on the table. It may also be used for meats and other purposes. The cooker is made in three sizes: Nos. 1, 2 and 3.

Diamond E Gate Valve.

"The gate valve shown in the accompanying cut is placed on the market by Ette & Henger Mfg. Company, St.

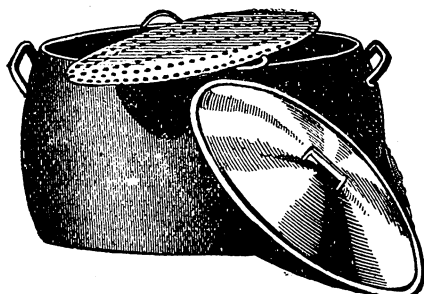


Samson Nail Puller and Box Opener.

good as new; that the jaws open and close positively, and that in use the puller will not bruise or smash the fingers. It is stated that by the strength and positive leverage of the tool it will pull nails with ease, giving it a range from a tack to a 20d nail; also that the puller is strong and durable.

Golden Crown Asparagus and Corn Cooker.

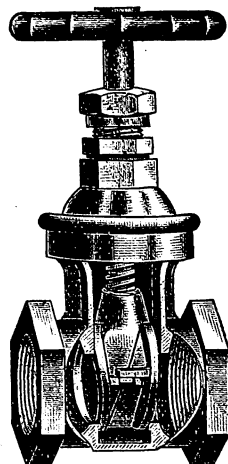
The cooker illustrated herewith is being offered by the Stuart & Peterson



Golden Crown Asparagus and Corn Cooker.

Company, Burlington, N. J. The cooker is an addition to their line of Golden Crown ware, and is provided

Louis, Mo. In construction, the principle of the body and disk is of the usual order, but having a diamond shaped wedge, tapered and higher in

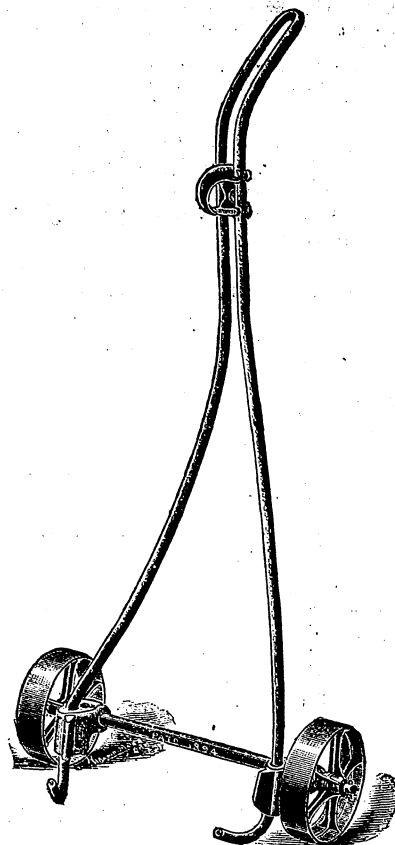


Diamond E Gate Valve.

the center than at the ends to insure a perfect seat and to overcome grinding. It is stated that each valve is tested to 300 pounds pressure and guaranteed to be perfect in all respects. These are made in regular sizes from $\frac{1}{4}$ inch to 6 inches.

Little Giant Steel Truck.

G. L. Van Namee Mfg. Company, Syracuse, N. Y., are offering the truck herewith shown. The truck is made

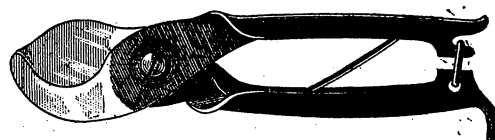


Little Giant Steel Truck.

entirely of metal, with wide tired wheels and well fitted bearings. It is provided with a self adjusting hook to secure the barrel at the top, also a clamp to prevent the axle from turning. The claim is made that the truck occupies but little space, and that while combining great strength it is in construction comparatively light, its total weight being 14 pounds. It is adapted for use in factories, stores, flour mills, &c., also for removing ash and garbage barrels. The above company are owners of the Little Giant Truck Company's plant.

Leavitt's Cast Steel Pruner.

New England Specialty Company, North Easton, Mass., are putting on the market the pruning shear illustrated



Leavitt's Cast Steel Pruner.

herewith. The pruner is made wholly of cast steel, oil tempered, with the steel spring for opening the pruner riveted firmly to the handle. The tool is 8 inches long and is referred to as cutting larger limbs and vines than ordinary pruners, owing to the peculiar construction of the jaw and blade. The manufacturers state that it is a better tool than the common cast iron pruner they are now making, costing but a trifle more, and that it is impossible to break it with fair usage.

Current Hardware Prices.

MAY 9, 1894.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

The character ϕ is used to indicate a range of price thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic..... ϕ doz \$3.00, 28 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 Excelsior..... ϕ doz \$10.00.....50&10&2 $\frac{1}{2}$
 North's.....list net @ 10 $\frac{1}{2}$
 Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—

Eagle Anvils, ϕ 2 $\frac{1}{2}$15@15&25
 Horse shoe brand, Wrought.....12@11 $\frac{1}{2}$
 Moore & Barnes Mfg. Co.....39&24

Imported—

Armitage Mouse Hole.....9 $\frac{1}{2}$ @10 $\frac{1}{2}$
 S. & H., machine finished.....10 $\frac{1}{2}$ @11 $\frac{1}{2}$
 Trenton.....9 $\frac{1}{2}$ @10 $\frac{1}{2}$
 Wilkinson's.....10 $\frac{1}{2}$ @11 $\frac{1}{2}$
 Peter Wright's.....10 $\frac{1}{2}$ @11 $\frac{1}{2}$

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40&10 $\frac{1}{2}$
 Cheney Anvil and Vise.....25 $\frac{1}{2}$
 Millers Falls Co., \$18.00.....20 $\frac{1}{2}$
 Star.....45&24

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Boring Machine Augers.....70@70&10 $\frac{1}{2}$
 Car Bits, 12-in. twist.....50 $\frac{1}{2}$
 Common Augers and Bits.....70@70&10 $\frac{1}{2}$
 Cincinnati Bell-Hangers' Bits.....30&10
 Forstner Pat. Auger Bits.....15 $\frac{1}{2}$
 Jennings' Pattern Car Bits.....40 $\frac{1}{2}$
 Jennings' Pattern Auger Bits.....60 $\frac{1}{2}$
 C. E. Jennings & Co., No. 10, extension..... ϕ
 Tip..... ϕ
 C. E. Jennings & Co., No. 80.....60 $\frac{1}{2}$
 C. E. Jennings & Co., Auger Bits, ϕ set
 82 $\frac{1}{2}$ quaters, No. 5, 3 $\frac{1}{2}$; No. 30, \$3.50, 25 $\frac{1}{2}$
 Russell Jennings' Augers and Bits, 25&10 $\frac{1}{2}$
 Lewis' Patent Single Twist.....45 $\frac{1}{2}$
 L'Homedieu Car Bits.....15&10 $\frac{1}{2}$
 Pugh's Black.....30 $\frac{1}{2}$
 Pugh's Jennings Pattern.....30 $\frac{1}{2}$
 Snell's Bits.....60&5@60&10 $\frac{1}{2}$

Bit Stock Drills—

Cleveland.....50&10&25 $\frac{1}{2}$
 Cincinnati, for wood.....30&10 $\frac{1}{2}$
 Cincinnati, for metal.....45&10 $\frac{1}{2}$
 Morse Twist Drills.....50&10&25 $\frac{1}{2}$
 New Process Twist Drill Co., 50&10&25 $\frac{1}{2}$
 Standard.....50&10&25 $\frac{1}{2}$
 Syracuse, for metal.....50&10 $\frac{1}{2}$
 Syracuse, for wood (wood list), 30@30&25 $\frac{1}{2}$

Expansive Bits—

Clark's small, \$18; large, \$26, 35@35&10 $\frac{1}{2}$
 Ives' No. 4, ϕ doz. \$90.....40 $\frac{1}{2}$
 Stearns, No. 1, \$22; No. 2, \$18.....35&10 $\frac{1}{2}$
 Stearns' No. 2, \$48.....20 $\frac{1}{2}$
 Swan's.....40 $\frac{1}{2}$

Gimlet Bits—

Bee.....25@25&10 $\frac{1}{2}$
 Common..... ϕ gross \$2.50@3.00
 Diamond..... ϕ doz \$1.25.....40&10 $\frac{1}{2}$
 Double Cut..... ϕ gross \$10.00, 40&10 $\frac{1}{2}$
 Hartwell's.....40&10 $\frac{1}{2}$
 Douglass.....60&10@60&10&25 $\frac{1}{2}$
 Ives.....45&10&10&25 $\frac{1}{2}$
 Shephardson's.....45&10&10&25 $\frac{1}{2}$

Hollow Augers—

Bonney's Adjustable, ϕ doz \$48.....50 $\frac{1}{2}$
 Cincinnati Adjustable.....25&10 $\frac{1}{2}$
 Cincinnati Standard.....25&10 $\frac{1}{2}$
 Douglass.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 French, Swift & Co. (Becher).....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 Ives'.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 Ives' Expansive, each \$4.50.....60&5 $\frac{1}{2}$
 Stearns.....20&10 $\frac{1}{2}$
 Universal Expansive, each \$4.50.....20 $\frac{1}{2}$
 Wood's.....25@25&10 $\frac{1}{2}$

Ship Augers and Bits—

L'Homedieu's.....15&10@15&10&25 $\frac{1}{2}$
 Snell's.....25@25&10 $\frac{1}{2}$
 Snell's Ship Auger Pat'n Car Bits.....15&10@15&10&25 $\frac{1}{2}$
 Watrous'.....25@25&10 $\frac{1}{2}$

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled..... ϕ gr. \$2.50@3.00
 Brad, Shouldered..... ϕ gr. \$1.30@1.50
 Peg, Pat..... ϕ gr. 35@38 $\frac{1}{2}$
 Peg, Should..... ϕ gr. \$1.50@1.55
 Scratch, Handled..... ϕ gr. \$4.00@4.50
 Scratch, Socket..... ϕ doz. \$1.10@1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands.....\$6.00@6.50
 First quality, other brands.....5.50@6.00
 Beveled add 50 $\frac{1}{2}$ ϕ doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1.....3 $\frac{1}{2}$ @4 $\frac{1}{2}$; 4 $\frac{1}{2}$ @5 $\frac{1}{2}$
 Nos. 7 to 14.....70 $\frac{1}{2}$
 Nos. 15 to 22.....47 $\frac{1}{2}$ $\frac{1}{2}$
 Nos. 19 to 22.....70 $\frac{1}{2}$
 Concord Axles, loose collar.....4 $\frac{1}{2}$ @5 $\frac{1}{2}$
 Concord es, so id collar..... ϕ doz

Bag Holders—See Holders, Bag.

Balances—

Sash—

Caldwell, low list.....30 $\frac{1}{2}$
 Pullman.....60 $\frac{1}{2}$

Spring—

Spring Balances.....40@40&10 $\frac{1}{2}$
 No. 2000 20 30
 Chatillon, ϕ doz.....\$0.80 0.95 1.75 net
 Chatillon Straight Balances.....40@40&10 $\frac{1}{2}$
 Chatillon Circular Balances.....50&10 $\frac{1}{2}$

Barb Wire—See Wire, Barb.

Bars—

Crow—

Cast Steel..... ϕ 2 $\frac{1}{2}$ @3 $\frac{1}{2}$
 Iron, Steel Points..... ϕ 2 $\frac{1}{2}$ @3 $\frac{1}{2}$

Basins, Wash—

Standard Fiberglass, No. 1, 10 $\frac{1}{2}$ -in., \$1.80;
 12-in., \$2.00; 15 $\frac{1}{2}$ -in., \$2.50; 15-in.,
 \$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82, 60&10 $\frac{1}{2}$
 60&10&25 $\frac{1}{2}$
 Chatillon's No. 1.....40 $\frac{1}{2}$
 Chatillon's No. 2.....50&10@50&10&25 $\frac{1}{2}$
 Custer's.....33 $\frac{1}{2}$

Beaters—

Egg—

Bryant's..... ϕ gross \$14.00
 Double (H. & R. Mfg. Co.) ϕ gro., No. 0
 \$12.00; No. 1, \$15.00; No. 2.....\$38.00
 Dover..... ϕ doz \$1.00@1.20
 Dover (Standard Co.)..... ϕ doz \$1.00
 Duplex (Standard Co.)..... ϕ doz \$1.00
 Duplex Extra Heavy (Standard Co.)..... ϕ doz \$1.50
 Easy (H. & R. Mfg. Co.)..... ϕ doz \$1.20
 Improved Acme (H. & R. Mfg. Co.)..... ϕ gro. \$9.00
 Silver & Co..... ϕ doz \$5.50
 Spiral..... ϕ gro \$4.25 @ \$4.50
 Triple (H. & R. Mfg. Co.)..... ϕ gro \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
 No. 2, \$2.....20 $\frac{1}{2}$

Bells—

Cow—

Common Wrought.....60&10 $\frac{1}{2}$
 Kentucky Durham.....70&10 $\frac{1}{2}$
 Kentucky, Sargent's list.....70&10 $\frac{1}{2}$
 Kentucky, "Star".....20&10 $\frac{1}{2}$
 Texas Star.....50&10@50&10&25 $\frac{1}{2}$
 Western, Sargent's list.....70&10 $\frac{1}{2}$

Door—

Crank, Brooks'.....50&10&25 $\frac{1}{2}$
 Crank, Cone's.....20&10 $\frac{1}{2}$
 Crank, Connel's.....20&10 $\frac{1}{2}$
 Gong, Abbe's.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 Gong, Barton's.....40&10@50 $\frac{1}{2}$
 Gong, Yankee.....45&10 $\frac{1}{2}$
 Lever, R. & E. Mfg. Co.'s.....50&10&25 $\frac{1}{2}$
 Lever, Sargent's.....60&10 $\frac{1}{2}$
 Lever, Taylor's Bronzed or Plated.....net
 Taylor's Japanned.....60&10 $\frac{1}{2}$
 Pull, Brooks'.....50&10&25 $\frac{1}{2}$

Electric—

Bigelow & Dowse.....20@20&10 $\frac{1}{2}$
 Wollensak's.....20@20&10 $\frac{1}{2}$

Hand—

Extra Heavy Brass.....70 $\frac{1}{2}$
 Light Brass.....70&10@70&10&25 $\frac{1}{2}$
 Silver Chime.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 White.....70 $\frac{1}{2}$
 Globe Cone's Patent.....25&10@35 $\frac{1}{2}$

Miscellaneous—

Call.....45@50 $\frac{1}{2}$
 Farm Bells..... ϕ 2 $\frac{1}{2}$ @3 $\frac{1}{2}$
 Steel Alloy Church and School Bells.....50 $\frac{1}{2}$

Bellows—

Blacksmiths'.....60&10&10&70 $\frac{1}{2}$
 Hand Bellows.....40&10@50 $\frac{1}{2}$
 Molders'.....40&10&50 $\frac{1}{2}$

Belting, Rubber—

Common Standard.....75&10@75&10&5 $\frac{1}{2}$
 Extra.....60&10&5&70 $\frac{1}{2}$
 Standard.....70&10@75 $\frac{1}{2}$
 N.Y.B.&P. Co., Carbon.....60&10&5 $\frac{1}{2}$
 N.Y.B.&P. Co., Double Diamond.....60 $\frac{1}{2}$
 N.Y.B.&P. Co., 1848 Para.....40&10 $\frac{1}{2}$

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 15@16&10 $\frac{1}{2}$
 Green River Tire Benders and Upsetters.....20 $\frac{1}{2}$
 Stoddard's Lightning Tire Upsetters.....15 $\frac{1}{2}$

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,
 see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....50&10&5 $\frac{1}{2}$
 Moore's Novelty, Mal. Iron.....50@50&5 $\frac{1}{2}$
 Sore Grip Steel Tackle Block, 25@25&10 $\frac{1}{2}$
 See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....80&10@80&10&5 $\frac{1}{2}$
 Genuine Eagle, Norway, list Oct. '84.....80&5@80&10 $\frac{1}{2}$
 Eagle, Norway, list Oct. '84.....80&5@80&10 $\frac{1}{2}$
 Phila. pattern, list Oct. 7, '84.....80 $\frac{1}{2}$
 R.B.&W., old list.....70 $\frac{1}{2}$
 Bolt Ends, list Jan. 1, 1890, 80&10@80&20 $\frac{1}{2}$
 Machine, list Jan. 1, 1890.....80&10@80&20 $\frac{1}{2}$

Door and Shutter—

Cast Iron Barrel Square, &c.....75&10@75&10&5 $\frac{1}{2}$
 Cast Iron Chain (Sargent's list).....65&10@65&10&5 $\frac{1}{2}$
 Cast Iron Shutter Bolts, 75&10@65&10&5 $\frac{1}{2}$
 Ives' Patent Door Bolts, 60&10@60&10&10 $\frac{1}{2}$
 Wrought Barrel.....75&10@80 $\frac{1}{2}$
 Wrt's B. K. Flush.....60&10@60&10&10 $\frac{1}{2}$
 Wrt's Shutter, Brass Knob.....50&10@50 $\frac{1}{2}$
 Wrt's Shutter, Sargent's list.....40&10 $\frac{1}{2}$
 Wrt's Shutter, all iron, Stanley's 65 $\frac{1}{2}$ @70 $\frac{1}{2}$
 Wrought Square.....75&10@80 $\frac{1}{2}$
 Wrt's Sunk Flush, Sargent's list.....40&10 $\frac{1}{2}$
 Wrt's Sunk Flush, Stanley's list, 6 $\frac{1}{2}$ @63&10 $\frac{1}{2}$

Stove and Plow—

Plow.....60&10@60&10&10 $\frac{1}{2}$
 Stove.....65&70 $\frac{1}{2}$
 R. B. & W., Plow.....55 $\frac{1}{2}$

Tire—

Common, list Feb. 28, '83.....70@70&10 $\frac{1}{2}$
 American Screw Company.....75 $\frac{1}{2}$
 Norway, Phila., list Oct. 16, '84.....75 $\frac{1}{2}$
 Eagle, Phila., list Oct. 16, '84.....80 $\frac{1}{2}$
 Bay State, list Feb. 28, '83.....70 $\frac{1}{2}$
 Port Chester Bolt and Nut Company:
 Empire list Feb. 28, '83.....70 $\frac{1}{2}$
 Keystone, Philadel., list Oct. '84.....80 $\frac{1}{2}$
 Norway, Phila., list Oct. '84.....75 $\frac{1}{2}$
 R. B. & W., Philadel., list Oct. 16, '84.....80 $\frac{1}{2}$

Borers, Tap—

Common and Ring.....20&10 $\frac{1}{2}$
 Clark's.....33 $\frac{1}{2}$ @35 $\frac{1}{2}$
 Enterprise Mfg. Co.....25 $\frac{1}{2}$
 Ives' Tap Borers.....35&24 $\frac{1}{2}$

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's.....40 $\frac{1}{2}$

Boxes, Wagon—

Per doz.....24 $\frac{1}{2}$

Boxes, Miter.

Spilker's Excelsior, 3 in. \$7.50, 4 in.
 \$8.50, 5 in. \$13.00, 6 in. \$15.00.....20 $\frac{1}{2}$

Braces—

American Bit Brace and Tool Co.....60&10 $\frac{1}{2}$
 Nos. 11, 21, 24, 27.....70&10 $\frac{1}{2}$
 Nos. 22, 23, 25.....60&10&5 $\frac{1}{2}$
 Nos. 13, 26, 36, 37.....70&10&5 $\frac{1}{2}$
 Amidon's.....50&10&25 $\frac{1}{2}$
 Barker's Imp'd Plain.....75&10@80 $\frac{1}{2}$
 Barker's Imp. Nickeled.....65&10@70 $\frac{1}{2}$
 Bates Ratchet.....75&10@80 $\frac{1}{2}$
 Biceps Ratchet.....60 $\frac{1}{2}$
 Gauge Jawed.....40&40&10 $\frac{1}{2}$
 Corner Brace.....40&40&10 $\frac{1}{2}$
 Universal, 8 in., \$2.10; 10 in.....\$2.25
 Buffalo Ball.....\$1.10@1.15
 Barber's.....50&10 $\frac{1}{2}$
 Bartholomew.....70 $\frac{1}{2}$
 Nos. 25, 27 and 30.....50&10@60&5 $\frac{1}{2}$
 Nos. 117, 118, 119.....70@70&5 $\frac{1}{2}$
 Common Ball, American.....\$1.00@1.10
 Davis Patent.....50&10 $\frac{1}{2}$
 Fray's Genuine Spofford's.....50&5@50&10 $\frac{1}{2}$
 Fray's Nos. 70 to 120, 81 to 123, 207 to 414
 50&10&25 $\frac{1}{2}$

Ives' New Haven Novelty.....70@70&5 $\frac{1}{2}$
 New Haven Ratchet.....60&5@60&10 $\frac{1}{2}$
 Barber Ratchet.....60&5@60&10 $\frac{1}{2}$
 Barber's.....60&5 $\frac{1}{2}$
 Spofford.....60&5@60&10 $\frac{1}{2}$
 P. S. & V. Co., Peck's Patent.....60 $\frac{1}{2}$
 Rose & Johnson.....60 $\frac{1}{2}$
 Sargent's.....70@70&10 $\frac{1}{2}$
 Other makes at a wide range of prices.

Shelf, plain.....65@70 $\frac{1}{2}$
 Sargent's list.....60&10@70&10 $\frac{1}{2}$
 Bradley Shelf Brackets.....70&10 $\frac{1}{2}$

Bright Wire Goods—See Wire.

Broilers—

Hens' Self, 1 inch.....9 10 9 $\frac{1}{2}$
 Basting, ϕ Per doz.....\$4.50 5.50 6.50
 Morgan, Cleverless..... ϕ doz. \$12, 50 $\frac{1}{2}$
 New Haven.....50 $\frac{1}{2}$
 Queen City.....33 $\frac{1}{2}$
 Wire Goods Co.....65&10 $\frac{1}{2}$

Buckets, Well and Fire—

See Pails, Galvanized.

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butcher's.

Butts—

Cast Brass, Fast.....33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 Cast Brass, Loose Joint.....33 $\frac{1}{2}$ @10 $\frac{1}{2}$
 Cast Brass, Tiebout's.....50 $\frac{1}{2}$
 Wrought Brass.....80&10@80&20 $\frac{1}{2}$

Cast Iron—

Fast Joint, Broad.....80@80&5 $\frac{1}{2}$
 Fast Joint, Narrow.....60@60&5 $\frac{1}{2}$

Loose Joint.....

Loose Joint, Japanned.....

Chalk Lines—See Lines.**Checks, Door—**

Unity	.....60%
Chisels—	
Socket Framing and Firmer	
Mix	
Ohio Tool Co.	75%10030%
P. S. & W.	
Wetherby	
Buck Bros	30%
Charles Buck	30%
Douglas	75%10030%
Merrill	80%10060%100%
L. & J. White	30%50%85%

Tanged and Miscellaneous.

Buck Bros	30%
Charles Buck	30%
Butcher & Jackson's	\$4.75@5.00 to 2
Tanged Firmers	50%50%100%
Cold Chisels, fair quality, # 14	14@16

Chucks—

Beach Pat.	each, \$5.00, 20%
Danbury	each, \$6.00, 30%30%5%
Graham Patent	30%
Morse's Adjustable, each, \$7.00, 20%20%5%	
Eyracuse, Balz Pat	25%
Skinner Patent Chucks	40%
Combination Lathe Chucks	40%
Drill Chucks	2%
Independent Lathe Chucks	40%
Planer Chucks	20%
Universal Lathe Chucks	40%
Union Mfg. Co.	
Combination	40%
Independent	40%
Universal	40%
Victor	\$8.50, 25%

Churns—

McDermaid Star Barrel Churn, each	6 gal., \$2.80; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.
Tiffin Union, each, 5 gal. \$3.25; 7 gal., \$3.75; 10 gal., \$4.25.	

Clamps—

Adjustable, Cincinnati	15%10%
Adjustable, Hammers	15%15%5%
Adjustable, Stearns	30%30%10%
Barnes' Machinists' Clamps	30%
Cabinet, Sargent's	70%10%
Carpenter's, Cincinnati	25%10%
Carriage Makers', P. S. & W. Co.	40%10%
Carriage Makers', Sargent's	75%15%5%
Eberhard Mfg. Co.	40%50%10%
Joiners' Clamps, Tatum's	25%10%
R. I. Tool Co.'s Wrought Iron	20%
Saw Clamps, see Vises, Saw Filers'	
Stearns' Malleable, with Wrought Iron	
Screw	75%75%5%
Warner's	40%10%40%10%5%

Cleavers, Butchers'—

Beatty's	40%50%40%10%
Bradley's	25%30%
Foster Bros	30%
New Haven Edge Tool Co.'s	30%
Nichols Bros.	30%
P. S. & W.	30%45%30%10%
Schulte, Lohoff & Co.	40%10%5%
L. & J. White	20%5%

Clips—

Baker Axle Clips	25%
Norway, Axle, # 18	80%5%
Norway Spring Bar Clips, 5-16	80%5%
2d grade Norway Axle # 4 & 5-16	65%5%
Steel Felloe Clips	40%4%
Superior Axle Clips	70%
Wrought Iron Felloe Clips	50%

Cloth and Netting, Wire—**Cocks, Brass—****Coffee Mills—See Mills, Coffee.****Collars, Dog—**

Brass, Pope & Stevens' list	40%
Chapman Mfg. Company, new list	40%
Embossed, Gilt, Pope & Stevens' list	30%10%
Leather, Pope & Stevens' list	40%
Medford Fancy Goods Co.	40%10%50%

Combs, Curry—

American Curry Comb	30%40%
Fitch's	50%10%50%10%10%
Gibb's Magnetic	20%
Kohler's Humane	20%
Kohler's Magic Oscillating	20%
Hubber, per doz.	10.00, 25%

Compasses, Dividers &c.—

Compasses, Callipers, Dividers, 70%10%75%	
Bemis & Call Co.'s	
Dividers	55%
Callipers, Call's Patent Inside	55%
Callipers, Double	55%
Callipers, Inside or Outside	55%
Callipers, Wing	55%
Compasses	50%5%
Excelsior	50%

Combination Dividers—

Lock Callipers and Dividers	25%
Spring Callipers and Dividers	25%10%
Stevens & Co.'s	25%10%

Coolers, Water—

S. S. & Co., 2-gal., \$2.00; 3-gal., \$2.50;	
4-gal., \$2.75; 5-gal., \$3.40 each.	30%5%

Coopers' Tools—**Cord—**

Braided, Crown, Drab and Fancy, # 1	55%
Braided, Crown White, # 1	50%
Cable Laid Italian Sash, # 1	20%
Common	80%
Common Russia Sash, # 1	12%10%13%
Egyptian, India Hemp, Braided, # 1	28%
India Cable Laid Sash, # 1	11%12%
Massachusetts, White, # 1	22%24%

Ossawa Mills—

Braided, Giant, Drab and Fancy, # 1	35%
Braided, Giant, White, # 1	30%
Patent, good quality	10%11%
Patent Russia Sash, # 1	13%14%

Braided, Drab Cotton—

Braided, Italian Hemp	42%
Braided, Linen	66%
Braided, White Cotton	87%
Semper Idem, Braided, White	28%

Silver Lake—

A quality, Drab, 55#	25%
A quality, White, 50#	25%
B quality, Drab, 35#	10%
B quality, White, 30#	10%
Sylvan Spring, Extra Braided, Drab	39%
Sylvan Spring, Extra Braided, White	34%

Vase's Solid Braided—

Economy, White	27%
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Hercules, Drab—**Wire Picture—**

Braided or Twisted	80%50%80%15%
Corkscrews—See Screws, Cork.	
Corn Knives and Cutters	
See Knives, Corn.	

Crackers, Nut—

Aome	
Japanned, # gro, \$30	50%
Nickel Plated, # gro, \$30	10%
Table (H. & B. Mfg. Co.)	40%
Turner & Seymour Mfg. Co.	50%

Cradles—

Grain	50%20%50%5%2%
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Crayons—

White Crayons, # gross	7@54
D. M. Steward Mfg. Co.	
Metal Workers', # gross	25%
Railroad, # gross	20%
Rolling Mill, # gross	25%
Soapstone Pencils, # gross, 1.50	25%

Creamery Pails—See Pails, Creamery.**Crow Bars—See Bars, Crow.****Curry Combs—****Cutters—****Meat—**

American	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Each	\$5 \$7 \$10 \$25 \$50 \$80
Enterprise	10 12 22 32 42
Each	\$3 \$2.50 \$4 \$8 \$15
Dixon's, # doz.	14.00@10.00%
Nos.	1 2 3 4
Draw Cut, each	\$1.00 \$1.70 \$1.90 \$5.00
Nos. 5 2 6 8	\$50 \$75 \$80 \$235, 20@25%

Hale's, # doz.

Nos.	11 12 13
Home No. 1, # doz.	\$27.00 \$33.00 \$45.00
Little Giant, # doz.	\$26.00 \$30.00 \$40.00
Nos. 305 310 312 320 322	
Miles Challenge, # doz.	\$35.00 \$48.00 \$44.00 \$72.00 \$88.00
Nos.	1 2 3
Triumph No. 505, # doz.	\$22.00 \$30.00 \$40.00
Woodruff's, # doz.	\$21.00, 25%30%
Nos.	100 150
Chadborn's Smoked Beef Cutter, # doz.	\$15.00 \$18.00
Nos.	100 150
Enterprise Beef Shavers	20%

Slaw and Kraut—**Tobacco**

Acme	# doz., \$20.00, 40%
All Iron	# doz., \$4.25
Champion	20%10%30%
Nashua Lock Co.'s, # doz.	\$18.00, 50%5%
National	# doz., \$21.00, 30%
Sargent's	# doz., \$22.00, 55%10%

Washer—

Appleton's, # doz.	\$18.00, 60%10%
Bonney's	30%10%
Cincinnati	25%10%
Johnson's	# doz., \$11.00, 30%4%
Penny's, # doz., Pol. #14; Jap'd, #16, 65%	
Smith's Pat.	# doz., \$12.00, 20%10%

Diggers, Post Hole, &c.—

Cronk's Post Bars, # doz.	\$80.00, 50%50%50%10%
Eureka Diggers:	
Western jobbers, # doz.	\$10.50@11.50
Eastern jobbers, # doz.	\$14@15
Fletcher Post Hole Augers, # doz.	\$38.00, 20%20%10%
Gem, Improved # doz.	\$9.00@10.00 net
Gibbs' Columbia	# doz., \$12.00
Gibbs' Hustler	# doz., \$10.00
Gibbs' Imperial	# doz., \$7.50
Gibbs' National	# doz., \$12.00
Gibb's Post Hole Digger	# doz., \$12.75
Kohler's Hercules	# doz., \$14.00
Kohler's Invincible	# doz., \$12.00
Kohler's Little Giant	# doz., \$18.00
Kohler's New Champion	# doz., \$8.00
Ryan's	# doz., \$20.00, 10%
Samson, # doz.	\$34.00, 25%25%10%
Scheldier	# doz., \$18.00
Shimer's Hollow Handle	# doz., \$24.00, 50%
Vaughan's Post Hole Auger, # doz.	\$8.50@9.50

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Checks—****Door Springs—****Drawers, Money—**

Money Drawers, # doz.	\$18@20
Waddell's Improved No. 1, # doz.	\$15.00
Waddell's Improved No. 2, # doz.	\$15.00
Waddell's Comb, Cutlery Case and Alarm Till	\$12.50

Drawing Knives—**Drills and Drill Stocks—**

Automatic Boring Tools	\$1.75@1.85
Bench Drills, Stearns	# doz., \$14
Blacksmiths' Self-Feeding, each	\$7.50, 20%
Breast, Bartholomew's	each \$2.50
Breast, Millers Falls	each \$3.00, 25%
Breast, P. S. & W.	40%10%
Breast, Wilson's	30%5%
Chicago Automatic Drill	20%10%
Goodell Automatic Drills	40%50%40%10%
Ratchet, Curtis & Curtis	30%
Ratchet, Ingersoll's	25%
Ratchet, Merrill's	20%20%5%
Ratchet, Moore's Triple Action	25%30%
Ratchet, Parker's	30%20%5%
Ratchet, Weston's	20%25%
Ratchet, Whitney's	20%10%
Whitneys Hand Drill, Plain, \$11.00;	
Adjustable, \$12.00	20%10%

Twist Drills—

Cleveland	50%10%10%
Diamond, W. & B.	50%10%10%
Graham's Pat. Groove Shank	50%10%10%
Morse	50%10%10%
New Process	50%10%10%
Standard	50%10%10%
Syracuse (Metal list)	50%10%

Drill Bits or Bit Stock**Drills—See Augers and Bits.****Drill Chucks—See Chucks.****Dripping Pans—****Drivers, Screw—**

Allard's Spiral, new list	25%
Brace Screw Drivers	25%10%
Buck Bros.	30%
Buck Bros', Screw Driver Bits	27%45%
Clark's Pat.	30%40%
Cincinnati	25%10%
Champion	25%10%
Disston's	50%
Douglas Mfg. Co.	20%20%10%
Ellich's Socket and Ratchet	25%25%10%
Fray's Hol. H. die Sets, No. 3, \$12.00, 45%	
Gay & Parsons	60%
Goodell's Automatic	50%50%5%
Knapp & Cowles	
No. 1	70%10%
No. 2	70%10%
No. 3	60%10%
Nos. 4 and 60, Aome and Ideal	60%10%
Kolb's Common Sense	# doz., \$6.00, 25%10%

Mayhew's Black Handle—**Mayhew's Monarch—****P. S. & W.****Sargent & Co's****No. 2, Forged Blade—****No. 20, 40 and 60****Screw Driver Bits, P. S. & W.****Stanley R. & L. Co's****No. 64, Varnished Handles—****No. 86****Stearns****Syracuse Screw Driver Bits—****C. Williamson Wire Novelty Co.****Egg Beaters—See Beaters, Egg****Egg Poachers—****Electric Bell Sets—****See Bells, Electric.****Emery—No. 4 to No. 54 to Flour CF****Kegs, # doz.****1/4 kegs, # doz.****1/2 kegs, # doz.****10-# cans, 10****10-# cans, less****than 10****Enameled and Tinned Ware—See Ware, Hollow.****Escutcheon Pins—****See Pins, Escutcheon.****Escutcheons—****Door Locks****Wood****Expanded Metal—****List No. 5.****Door Mats, Galvanized****Fencing, Painted Sheets****Lathing****Netting, Painted Sheets****Tree Guards, Panoled****Window Guards, Panoled****Extractors, Lemon Juice****See Squeezers, Lemon.****Fasteners, Blind—****Austin & Eddy No. 2008****Mackrell's, # doz.****Security Gravity****Van Sand's Old Pat, \$15 # gr.****Van Sand's Screw Pat, \$15 # gr.****Zimmerman's****Faucets—****B. & L. B. Co.****West's Lock, Open and Shut Key****Burnside's Red Cedar****Burnside's Red Cedar, bbl. 100#****Cork Lined****Fenn's****Fenn's Cork Stops****Fray's Pat. Petroleum****Metallie Key, Leather Lined****National Measuring, # doz.****John Sommers****Peerless Best Block Tin Key****IXL, 1st quality, Cork Lined****Diamond Lock****Perfection, Plain,**

Halters—

Cover's Ad. Rope Halters.....	40&25
Cover's Ad. Web Halters.....	35&25
Cover's Hemp Horse and Cattle Ties.....	50&10&25
Cover's Jute Cattle Ties.....	70&10&25
Cover's Jute Horse Ties.....	70&25
Cover's Rope, 7-16 in., Jute.....	70&25
Cover's Rope, 7-16 in., Hemp.....	60&25
Cover's Rope, Jute.....	60&10&25
Cover's Saddlery Works Halters.....	35&25
Cover's Saddlery Works Handy Web Halters.....	35&25
Cover's Saddlery Works Horse and Cattle Ties.....	35&25

Hammers—**Handled Hammers—**

Atha Tool Co.....	50&10&60
Buffalo Hammer Co.....	50&10&60
Humason & Beckley.....	50&10&60
Verree.....	50&10&60
Cheney's Claw.....	40&10
Cheney's Machinist's & Riveting.....	50&25
C. Hammond & Son.....	40&10&50
Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50 & 1.75.....	30&10
Maydole's, list Dec. 1, '85.....	25&10&35
Peck, Stow & Wilcox.....	40&10&35
Fayette R. Plumb.....	40&10
Artisan's Choice, A. E. Nail.....	40&10
Horseshoe Turning Hammers.....	50
Regular Y. & P., A. E. Nail.....	50
Other Hammers.....	50&10
Sargent's.....	40&10&55
Warner & Nobles, new list.....	25&10

Heavy Hammers and Sledges—

3 lb and under.....	40&10
5 lb.....	40&10
Over 5 lb.....	80&30&10
Wilkinson's Smiths.....	10&10&10

Handcuffs and Leg Irons—

See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins, new list.....	40
Champion.....	15
Ely's Perfection.....	40
Sensible.....	40

Iron, Wrought or Cast—

Barn Door, 7 doz \$1.40.....	20&5
Bronze Iron Drop Latches.....	70
Chest and Lifting.....	70&10&75
Door or Thumb.....	70
Nos.....	1 2 3 4
Per doz.....	\$0.90 1.00 1.08 1.35 1.50

Wood—

Brad A.W.I.....	gr 2.00
Apple Firmer.....	gr 2.00
Apple Firmer Chisel, large.....	gr 6.00
Hickory Firmer Chisel, ass'd.....	gr 4.50
Hickory Firmer Chisel, large.....	gr 5.00
Socket Firmer Chisel, ass'd.....	gr 3.00
Socket Framing Chisel, ass'd.....	gr 5.00

Hangers—

Barn Door, New England.....	70&70&5
Barn Door, old patterns.....	70&70&5
Berry.....	50
Best Anti-Friction.....	60&10&60
Boss and Friction.....	60&10&60
Carrier Steel Anti-Friction.....	50&10
Champion.....	60&10
Chicago Anti-Friction.....	30&10
Chimney Anti-Friction.....	55
Cincinnati Nos. 1, 2, 3, 2.25; 3, 2.50; 4, 2.50.....	60&10&10
Crescent.....	60&10&10
Cronk's Patent, Steel Covered.....	50&10
Duplex (Wood Track).....	60&10&5
Economy.....	36.00
Hamilton Wrought Steel Track.....	55
Interstate.....	60&10&60
Kidd's.....	60&10&60
Lane's New Standard.....	60&10&5
Lane's Parlor.....	40&40&5
Lane's Standard.....	50&50&10
Lundy, Steel Parlor.....	40
Magie.....	45&10
Matchless.....	50&10
Moody.....	45
Moore's Baggage Car Door.....	35
Moore's Elevator.....	35
Moore's Railroad.....	55
Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15.....	40&10&50
Orleans Steel.....	55
Paragon Nos. 5, 7 and 8.....	40&10
Pendulum, Fayson's.....	40&10&5
Perfection.....	50&10&50
Richards.....	30&30&10
Samson Steel Anti-Friction.....	55
Star.....	40&10&40
Stearns' Anti-Friction.....	20&10&10
Stearns' Challenge.....	25&10&10
Sterling.....	50&10&60
Terry's Ideal.....	50&10&50
Terry's Modern.....	50&10&50
Terry's Shield.....	50&10&60
Terry's Solid.....	50&10&60
Terry's Wrought Single Strap.....	50&10
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	50
Warner's Pat.....	20&10&10
Wild West.....	45&10
Zentith for Wood Track.....	55

Hinges—

Clark's.....	75&10&55
Nos. 1, 3, 5, 1868, Old Pattern.....	75&10&55
No. 50 Buffalo Noiseless, 40, 60 and 85.....	75
Buffalo Reversible, Nos. 3, 2, 1, 1 and 0.....	70&5
No. 1, Cottage, for wood only.....	80&10
No. 1, Diamond, for wood only.....	80&5
Dixie L. & P., Nos. 3, 2, 1, 1, 0, 0, 4 and 5.....	75&5
No. 25, Empire Reversible.....	75&10&5
Lull & Porter, Nos. 3, 2, 1, 1, 0, 0, 4 and 5.....	75&10&5
Mortise Gravity, Nos. 2, 4, 4, 6, 8, 10 and 10.....	50&50&10
Hunter.....	50&50&10
Parker.....	75&10
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....	10
Reading's Gravity.....	75&10&75&10&55
Sargent's Nos. 1, 3, 5, 11, 12.....	75&10&75&10&55

Gate Hinges—

Automatic.....	40
Clark's, Nos. 1, 2, 3.....	60&10&60
N. E. Reversible.....	60&10&60
N. E. State.....	60&10&60
Shepard's Nos. 1, 2, 3.....	60&10&60
Western.....	60&10&60

Spring Hinges—

American.....	20
Bardsley's Patent Checking.....	15
Barker's Double Acting.....	25
Bommer's Japanned.....	35
Bommer's All other Kinds.....	30
Buckman's.....	15&20
Champion.....	30
Columbia.....	30
Crown.....	20
Devore, No. 1.....	13.00
Freeport.....	12.00
Geer's Spring and Blank Butts.....	40
Idea No. 3.....	38.00
J. G. C. Covered.....	130.00
Knoxall.....	12.00
New Idea No. 1.....	12.00
New Idea No. 2.....	18.00
New Idea Dbl. Acting.....	45
No. 25 Unbreakable.....	60
Oxford.....	20
Reliable.....	60
Rex.....	13.00
Royal.....	60
Samson.....	60&60&75
Stearns' Noiseless Floor Hinge.....	35
Surprise.....	12.00
Union Mfg. Co.....	25
Union Spring Hinge Co.'s list, March, 1886.....	20
Wiles, No. 1.....	16
No. 2.....	13

Wrought Iron Hinges—

Corrug'd Strap and T.....	60&10&60
Strap and T.....	60&10&60
Plate Hinges, 8, 10 & 12 in.....	60
"Providence" over 12 in.....	60
Roller Blind Hinges, Nos. 32 and 34.....	50&10
Roller Blind Hinges, Nos. 23 and 24.....	50&10
Roller Raised.....	70&10
Roller Plate.....	70&10
Screw Hook and Eye.....	14 to 30 in.....
Screw Hook and 14 to 30 in.....	23 to 36 in.....

Hoes—

Scott and Oval Pattern.....	50&10&60
D. & H. Scovill.....	20&30
Grub.....	60&10
Lane's Crescent, Planters' Pattern.....	45&55
Lane's Razor Blade, Scovill Pat.....	30&5

Handled—

Garden, Mortar, &c.....	70&70&5&2
Magie.....	40&10
Planter's Cotton, &c.....	70&70&5&2
Warren Hoe.....	80&60&5

Hog Rings and Rings—

See Rings and Rings—

Holisting Apparatus—

See Machines, Holisting.

Hollow-Ware—

See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat.....

Bit—

Angular.....

Diagonal.....

Extension.....

Barber's.....

Ives.....

File and Tool—

Bals Pat.....

Nicholson File Holders.....

Sash—

Motley's Adj. Sash, Medium Size.....

Hooks—

Cast Iron—

Bird Cage, Reading.....

Bird Cage, Sargent's List.....

Clothes Line, Sargent's List.....

Hay and Straw Knives

See Knives.

Hinges—**Blind Hinges—**

Clark's.....

Nos. 1, 3, 5, 1868, Old Pattern.....

No. 50 Buffalo Noiseless, 40, 60 and 85.....

Buffalo Reversible, Nos. 3, 2, 1, 1 and 0.....

No. 1, Cottage, for wood only.....

No. 1, Diamond, for wood only.....

Dixie L. & P., Nos. 3, 2, 1, 1, 0, 0, 4 and 5.....

No. 25, Empire Reversible.....

Lull & Porter, Nos. 3, 2, 1, 1, 0, 0, 4 and 5.....

Mortise Gravity, Nos. 2, 4, 4, 6, 8, 10 and 10.....

Hunter.....

Parker.....

North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....

Reading's Gravity.....

Sargent's Nos. 1, 3, 5, 11, 12.....

Shepard's.....

Acme, Lull & Porter, Nos. 3, 2, 1, 1, 1, 0, 0, 4 and 5.....

Buffalo Gravity Locking, Nos. 1, 3 and 5.....

Champion Gravity Locking, No. 1.....

Clark's or Shepard's 1868, Old Pattern, Nos. 1, 3 and 5.....

Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5.....

Double Locking, Nos. 20 and 25.....

Empire, Nos. 101 and 103.....

Niagara Gravity Locking, Nos. 3 and 5.....

Noiseless, Nos. 50, 60, 65 and 55.....

O. S. Lull & Porter, Nos. 3, 2, 1, 1, 0, 0, 4 and 5.....

Pioneer, Nos. 060, 45 and 55.....

Steamboat Gravity Locking No. 10.....

Gate Hinges—

Automatic.....

Clark's, Nos. 1, 2, 3.....

N. E. Reversible.....

N. E. State.....

Shepard's Nos. 1, 2, 3.....

Western.....

Spring Hinges—

American.....

Bardsley's Patent Checking.....

Barker's Double Acting.....

Bommer's Japanned.....

Bommer's All other Kinds.....

Buckman's.....

Champion.....

Columbia.....

Crown.....

Devore, No. 1.....

Freeport.....

Geer's Spring and Blank Butts.....

Idea No. 3.....

J. G. C. Covered.....

Knoxall.....

New Idea No. 1.....

New Idea No. 2.....

New Idea Dbl. Acting.....

No. 25 Unbreakable.....

Oxford.....

Reliable.....

Rex.....

Royal.....

Samson.....

Stearns' Noiseless Floor Hinge.....

Surprise.....

Union Mfg. Co.....

Union Spring Hinge Co.'s list, March, 1886.....

Wiles, No. 1.....

No. 2.....

Wrought Iron Hinges—

List February 14, 1891.....

Corrug'd Strap and T.....

Strap and T.....

Plate Hinges, 8, 10 & 12 in.....

"Providence" over 12 in.....

Roller Blind Hinges, Nos. 32 and 34.....

Roller Blind Hinges, Nos. 23 and 24.....

Roller Raised.....

Roller Plate.....

Screw Hook and Eye.....

Screw Hook and 14 to 30 in.....

Strap.....

Hoes—**Eye—**

Scott and Oval Pattern.....

D. & H. Scovill.....

Grub.....

Lane's Crescent, Planters' Pattern.....

Lane's Razor Blade, Scovill Pat.....

Handled—

Garden, Mortar, &c.....

Magie.....

Planter's Cotton, &c.....

Warren Hoe.....

Hog Rings and Rings—

See Rings and Rings—

Holisting Apparatus—

See Machines, Holisting.

Hollow-Ware—

See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat.....

Bit—

Angular.....

Diagonal.....

Extension.....

Barber's.....

Ives.....

File and Tool—

Bals Pat.....

Nicholson File Holders.....

Sash—

Motley's Adj. Sash, Medium Size.....

Hooks—**Cast Iron—**

Bird Cage, Reading.....

Bird Cage, Sargent's List.....

Clothes Line, Sargent's List.....

Clothing, Sargent's List.....

Clothes Line, Moore's.....

Clothes Line, Reading.....

Coat and Hat, Moore's.....

Coat and Hat, Reading.....

Coat and Hat, Sargent's List.....

Hammock, E. C. Stearns & Co., per doz.....

Wire—

Atlas, Coat and Hat.....

Belt.....

Handy Hat and Coat.....

Plate.....\$34.25
 Romer's Night Latches.....15¢
 R. & E. Mfg. Co., list Mar. 20, 1889.
 60&10070
 Sargent & Co., list Aug. 1, 1892. 60&10070
 Warner's Burglar Proof. # doz. \$8.00, 50¢
 Yale.....net prices

Elevator—

Moore's.....38½%

Padlocks—

Wrought Iron Padlocks:
 Brittan, Graham & Mathes, list
 Jan., 1894.....75¢
 Mallory, Wheeler Co., list Jan. 1,
 1894.....75¢
 Norwich Lock Mfg. Co., list June
 10, 1891.....50&25¢
 Russell & Erwin Mfg. Co., list June
 10, 1891.....50&25¢
 Sargent & Co., list January 1, 1894.
 William Wilcox Mfg. Co., list Janu-
 ary 1, 1894.....75&20¢
 Ames Sword Co. up to No. 150.....40¢
 Ames Sword Co. above No. 150.....50¢
 Barnes Mfg. Co.....40&4010¢
 Champion Padlocks.....40¢
 A. E. Deitz.....40¢
 Eagle.....40¢
 Eureka, Eagle Lock Co.....40&25¢
 R. F. Fraim's Keystone Scandinavian
 1010 line.....90&40¢
 120 line.....90&25¢
 109 line.....70&10¢
 510 line.....70&10¢
 225, 610 and 200 lines.....50&5¢
 All other numbers.....50&5¢
 Horseshoe.....# doz \$9.50 60&10¢
 Hotchkiss.....30¢
 No. 1.....30¢
 Romer's Nos. 0 to 91.....30¢
 Romer's Scandinavian, &c., Nos. 100 to
 505.....15¢
 Scandinavian.....90&50¢
 Slaymaker, Barry & Co.....90&50¢
 No. 41 line.....50¢
 No. 61 line.....60¢
 No. 21 line.....80¢
 Star.....60¢
 Yale Lock Mfg. Co.'s.....net prices

Sash, &c.—

Attwell Mfg. Co.....25&33½¢
 Champion Safety list January, 1893. 70&5¢
 Clark's No. 1, \$10; No. 2, \$8 gr.....33½¢
 Common Sense, Jap'd, Cop'd and
 Br'zed.....# gr \$4.00
 Common Sense, Nickel Plated.....# gr \$4.00
 Corbin's Daisy, list Feb. 15, 1888.....70¢
 Davis Bronze, Barnes Mfg. Co.....60¢
 Ferguson's.....33½¢
 Fish (Liesche's pat.), No. 100, # gr.....50¢
 No. 105, # gr.....\$10.
 Giant, list Jan., 1892.....70&3¢
 Hammond's Window Springs.....40¢
 Huginlin's New Sash Locks.....25&5&2¢
 Huginlin's Sash Balances.....25&5&2¢
 Ives' Patent.....60&10&5¢ 60&10&10¢
 Kempshall's Gravity.....60¢
 Kempshall's Model.....60&60&10¢
 Monarch.....60&60&10¢
 Payson's Perfect.....60&10&5¢ 60&10&10¢
 Reading.....60&10&5¢ 60&10&10¢
 Security.....70¢
 Universal.....30¢
 Victor.....60&10&2¢
 Walker's.....10¢
 Wolcott's.....60&10&5¢

Lumber Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles.....# doz, \$1.75; #
 gross.....\$17.00

Machines.

Boring—

Without
 Angers, Upright, Angular.
 Boss, Carpenters' 3.60
 Boss, Ship Blids' 3.85
 Douglas.....\$5.50 6.75.....50¢
 Jennings.....5.50 6.75.....50&50&25¢
 Millers Falls.....7.50.....25¢
 Phillips' Patent
 with Anger.....7.00 7.50.....40&10&10¢
 Snell's, Rice's Pat 5.50 6.75.....40&10&10¢

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
 \$4.50 each.....35¢
 Combined Fluter and Sad Iron.....# doz \$15.00.....80¢
 Crown, 4½ in., \$3.50; 6 in., \$4.00; 8 in.,
 \$6.50 each.....35¢
 Crown Hand Fluter, Nos. 1, \$15.00; 2,
 \$12.50; 3, \$10.00; 4, \$8.25.....30¢
 Crown Jewel, 6 in.....\$3.50 each, 35¢
 Domestic Fluter.....each, \$1.50
 Eagle, 2½-inch Rolls, \$2.15.....35¢
 Eagle, 4½-inch Rolls, \$2.85.....35¢
 Knox, 6-inch Rolls.....\$3.25 each; 35¢
 Knox, 6-inch Rolls.....\$3.50 each; 35¢

Hoisting—

Moore's Anti-Friction Differential Pul-
 ley Block.....20¢
 Moore's Hand Hoist, with Lock Brake.....20¢
 Moore's Rope Differential Pulley
 Block.....60¢
 Maris & Beekley (Teal Patent).....30¢
 See also Blocks.

Washing—

Fair and Square.....# doz \$42.00
 Anthony Wayne, # doz, No. 1, \$42; No.
 2, \$24.....# doz \$36.00
 Wayne American.....# doz \$64.00
 Wells.....# doz \$64.00
 Western Star # doz, No. 2, \$36; No. 3
 \$39

Mallets—

B. & L. Block Co., Hickory & L. V.
 30&10&40¢
 Vibre Head, Stearns.....33½¢
 Hickory.....20&10&20&10&10¢
 Lignumvite.....20&10&20&10&10¢

Mattocks—Regular list.

60&10&60&10&5¢

Measures—

Standard Fibreware, No. 1, peck #
 dozen, \$5.50; ¼-peck, \$5

Meat Cutters—

See Cutters, Meat.

Menders, Harness—

Per doz.....\$2.70

Milk Cans—See Cans, Milk.

Mills—

Coffee—

Box and Slide, list Jan. 1, 1888. 60&10¢
 Net prices are often made which are
 lower than above discount.

American, Enterprise Mfg. Co., list Jan.
 17, 1893.....20¢
 National List, Jan. 1, 1894.....30¢
 Swift, Lane Bros.....30¢
 Waddell's New Box Mills, Idea.....30¢
 Brand, New List.....60&60&10¢

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Highest 10 in. 12 in. 14 in.
 Grade, \$4.00 \$5.25 \$4.50 \$6.00 \$6.75
 Good \$3.00 \$3.25 \$5.00
 Cheap.....2.25 2.50 2.75

Muzzles—

Safety.....# doz, \$3.00, 25¢

Nails—

Cut and Wire. See Trade Report.

Wire Nails, Papered.

Association list, May 1, '92.....85&10¢

Hungarian, Finishing, Upholsterers', &c.
 See Tacks.

Horse—

Nos. 6 7 8 9 10

A. C.....25¢ 23¢ 22¢ 21¢ 21¢

American.....9½ 9¼ 9½ 9¼ 9½ net

Anchor.....23¢ 21¢ 20¢ 19¢ 18¢ 35¢

Ausable.....28¢ 26¢ 25¢ 24¢ 23¢

Capewell.....19¢ 18¢ 17¢ 16¢ 15¢ 10&5¢

C. B. K.....25¢ 23¢ 22¢ 21¢ 21¢ 40¢

Champion.....25¢ 23¢ 22¢ 21¢ 20¢

Champlain.....28¢ 26¢ 25¢ 24¢ 23¢

Clinton, Fin.....19¢ 17¢ 16¢ 15¢ 14¢ 30&5¢

Empire Bronzed.....11¢ 11½¢

Essex.....28¢ 26¢ 25¢ 24¢ 23¢

Lyra.....9½ 9¼ 9½ 9¼ 9½ net

Maud S.....25¢ 23¢ 22¢ 21¢ 21¢ 50&10&5¢

Northwestern.....25¢ 23¢ 22¢ 21¢ 20¢

Putnam.....23¢ 21¢ 20¢ 19¢ 18¢ 15¢

Snowden.....9½ 9¼ 9½ 9¼ 9½ net

Standard.....23¢ 21¢ 20¢ 19¢ 18¢ 35¢

Volcan.....23¢ 21¢ 20¢ 19¢ 18¢ 25¢

Western.....23¢ 21¢ 20¢ 19¢ 18¢ 50¢

Picture—

Brass Head, Combination list.....50&10¢

Brass Head, Sargent's list.....60&60&10¢

Porcelain Head, Combination list.....40&10¢

Porcelain Head, Sargent's list.....50&10&10¢

Niles' Patent.....40¢

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Square, Hex.

Cold Punched.....5.00 6.10 off list

Hot Pressed.....5.50 6.50 off list

In packages of 100 lb, add 1-10¢ #

net; in packages less than 100 lb, add

¼¢ # lb, net.

Oakum—

Best or Government.....# lb 6¼¢ 6½¢

Best or Government.....# lb 6¼¢ 6½¢

U. S. Navy.....# lb 5¼¢ 5½¢

Oil Tanks—See Tanks, Oil.

Oilers—

Brass and Copper.....50&10&50&10&5¢

Zinc and Tin.....70&70&10¢

Broughton's Brass.....30¢

Broughton's Zinc.....60¢

Malleable, Hammers' Improved No. 1,
 \$3.50; No. 2, \$4.00; No. 3, \$4.40 # doz

10&10&5¢

Malleable, Hammers' Old Pattern, same
 list.....45¢

Olmead's Brass and Copper.....50¢

Olmead's Tin and Zinc.....60¢

Prior's Pat. or "Paragon" Zinc.....50¢

Prior's Pat. or "Paragon" Zinc.....50¢

Steel, Draper & Williams.....50¢

Wilmot & Hobbs Mfg. Co., Steel Anti-
 Rust.....60¢

Openers, Can—

Champion, # doz \$2.00.....50¢

Domestic, # doz \$2.00.....45¢

Duplex.....# doz 25¢, 15¢ 20¢

Eureka.....# doz \$2.50, 10¢

Excelsior, No. 1 \$2.50; No. 2, \$1.50.....40¢

French, No. 4.....# doz \$2.25, 55¢ 80¢

Iron Handle, No. 5.....# gr \$6.00, 45¢ 80¢

Lyman's.....# doz \$2.00, 20¢

Messenger's Comer.....# doz \$3.00, 50¢

Moore's.....70¢

Sardine Scissors.....# doz \$2.75 \$3.00

Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢

Star.....# doz \$2.75

Universal, # doz \$3.00.....55&25¢

World's Best, # gross, No. 1, \$12.00;
 No. 2, \$24.00; No. 3, \$36.00.....50&10¢

Packing, Steam—

Rubber—

Standard, fair quality.....70&10&75¢

Superior quality.....75&10&80¢

Extra.....60&50¢ 60&10&5¢

Jenkin's Standard, # 80.....25&25&5¢

N. Y. B. & P. Co., Double Diamond.....60¢

N. Y. B. & P. Co., Salamander.....45¢

N. Y. B. & P. Co., Carbon.....70&5¢

Miscellaneous—

American Packing.....9¢ 10¢ # lb

Cotton Packing.....14¢ 15¢ # lb

Italian Packing.....13¢ 14¢ # lb

Jute.....6¢ 7¢ # lb

Russia Packing.....18¢ 14¢ # lb

Pails—

S. S. & Co., 18-qt., \$7.00; 20-qt., \$7.25

doz.....5¢

Galvanized Pails

Light Heavy

10 Quart.....\$2.00 \$2.25 \$2.25 \$2.50

12 Quart.....2.25 2.50 2.50 2.75

14 Quart.....2.50 2.75 2.75 3.00

Galvanized Buckets—

Fire Well

10 Quart.....\$2.50 \$2.75 \$2.25 \$2.50

12 Quart.....2.75 3.00 \$2.25 \$2.50

14 Quart.....3.00 3.25 2.50 2.75

Indurated Fiber Ware

Fire Pails, deep.....# doz \$4.80

Fire Pails, round bottom.....# doz \$5.40

Milk, 14 qt.....# doz \$5.40

Stable, 14 qt.....# doz \$6.00

Star Pails, 12 qt.....# doz \$4.20

Standard Fiber Ware—

Buggy Pails.....Plain, Decor'd

Chamber Pails, 14 qt.....6.00 \$7.00

Dairy Pails, 14 qt., # doz.....3.75 4.25

Fire Pails, No. 1, 12 qt., # doz.....3.75

Fire Pails, No. 2, 14 qt., # doz.....4.25

Horse Pails.....4.00

Sugar Pails.....5.00 5.50

Water Pails, 12 qt., # doz.....3.15 3.75

Pans—

Dripping—

Large sizes.....# lb 5¢

Small sizes.....# lb 5¢

Silver & Co. (Covered).....40¢

Fry—

Standard List:

No. 1.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25

No. 2.....5 6 7 8

doz.....\$6.00 \$7.00 \$8.00 \$9.00

Polished, regular goods.....75¢ 75¢ 10¢

Aome Fry Pans.....60&5¢

Dust—

Steel Edge, No. 1.....# doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, \$2; 20,
 \$2.50; 30, \$3.50 each.....60&10¢

Paper and Cloth—

Sand and Emery—

List April 19, 1888.....50&10&60¢

Sibley's Emery and Crocus Cloth.....30¢

Parers—

Apple—

Advance.....# doz \$4.75

Baldwin.....# doz 5.25

Bonanza.....each 5.00

Daisy.....# doz 4.00

Dandy.....each 7.50

Eclipse.....# doz 4.00

Eureka, 1888.....each 18.00

Favorite Bay State.....# doz 12.00

Favorite.....# doz 5.00

Gold Medal.....# doz 4.00

Pullers Nail-

Roller..... 70¢ doz., \$24.00, 40¢
 Economy..... 70¢ doz., \$5.60 to \$6.00
 Giant, No. 1..... 70¢ doz., \$18.00, 10¢ 10¢
 Giant, No. 2..... 70¢ doz., \$18.00, 10¢ 10¢
 Pelican..... 70¢ doz., \$9.00, 25¢ 10¢
 Scranton..... 70¢ doz., \$18.00, 85¢ 35¢ 10¢

Pulleys-

Brass Screw..... 70¢
 Hay Fork, "Anti-Friction," 5 in. solid..... 70¢
 Hay Fork, "Common" and Patent..... 50¢
 Hay Fork, "Anti-Friction" 5 in. Wheel, 70¢ doz., \$12.00, 40¢
 Hay Fork, "Self-Lubricating" 80¢
 Hay Fork, Solid Eye, 4.00; Swivel, 4.50
 Hay Fork, Stearns' Nos. 15, 25, 56, 66, 68, 60¢
 Hay Fork, Tarbox Pat. Iron..... 20¢
 Hot House, Awning, 60¢ 70¢
 Japanned Clothes Line..... 60¢ 10¢ 10¢
 Japanned Screw..... 70¢ 10¢ 10¢
 Japanned Side..... 70¢ 10¢ 10¢
 Moore's Ceiling, End, Anti-Friction..... 50¢
 Moore's Dumb Wreath Anti-Friction..... 50¢
 Moore's Electric Light..... 35¢ 10¢
 Moore's Side, Anti-Friction..... 60¢
 Sash (Auger Mortise)..... 60¢
 Common Sense..... 60¢
 Empire..... 60¢
 Acme..... 60¢
 Ideal, Nos. 2, 4, 10 & 15..... 60¢ less 1¢
 Star..... 60¢
 On bill. lots extra 5¢.
 Shade Rack..... 45¢
 Sheppard's Niagara, No. 25..... 70¢ 23¢ net
 Tackle Blocks-See Blocks.

Pumps-

Cistern, Beet Makers..... 60¢ 10¢ 10¢
 Pitcher Spout, Beet Makers..... 70¢ 70¢ 10¢
 Pitcher Spout, Cheaper G'ds..... 75¢ 75¢ 10¢
 Myers' Pumps, low list..... 60¢

Punches-

Avery's Revolving..... 40¢
 Avery's Sawset and Punch-See Sawsets
 Bemis & Call Co.'s Cast Steel Drive..... 50¢ 55¢
 Bemis & Call Co.'s Check..... 55¢
 Bemis & Call Co.'s Spring..... 50¢ 55¢
 Bemis & Call Co.'s Springfield Socket..... 50¢ 55¢
 Niagara Hollow Punches..... 20¢ 25¢
 Niagara Solid Punches..... 55¢
 Rice Hand Punches..... 15¢
 Saddle's or Drive, good..... 60¢ 65¢
 Spring, good quality..... 25¢ 30¢ 25¢
 Spring, Leach's Pat..... 15¢
 Solid Tinnings, F. S. & W. Co., 70¢ doz.
 Tinnings' Hollow Punches, F. S. & W. Co., 20¢ 25¢

Rail-

Barn Door, Light, In. 1/2..... 3/4
 Per 100 feet..... \$2.00 2.50 3.10, 10¢
 B.D. for N. E. Hangers.....
 Small Med. Large.
 Per 100 feet..... 2.70 3.25 Net
 Carrier, double braced, Steel Rail, 7/8 foot..... 3/4 4/4
 Lundy Parlor Door, Planed Edge, 7/8 ft..... 4/4
 Moody Steel Rail 7/8 ft., 5/8..... 4/4
 Moore's Steel Rail..... 25¢ 10¢
 Sliding Door, Bronzed Wrt Iron, 7/8 ft., 7/8
 Sliding Door, Iron, Painted, 7/8 ft., 4/4
 Sliding Door, Wrt Brass, 7/8 ft., 4/4
 Terry's Steel Rail, 7/8 ft., 4/4
 Victor Track Rail, 7/8 ft., 4/4..... 50¢ 25¢

Rakes-

Cast Steel, Association G'ds..... 70¢ 70¢ 55¢ 25¢
 Cast Steel, outside G'ds..... 70¢ 70¢ 55¢ 25¢
 Malleable, good..... 70¢ 70¢ 55¢
 Malleable, low grade..... 75¢
 Fort Madison Prize Bow Brace and Peerless..... 65¢
 Fort Madison Steel Tooth Lawn Rake..... 60¢
 Gibbs..... 25¢
 Gibbs' Acme Lawn Rake..... 40¢
 Gibbs' Cantor..... 40¢
 Gibbs' Crown Lawn Rake, No. 1..... 35¢
 Gibbs' Crown Lawn Rake, No. 2..... 35¢
 Gibbs' Favorite Lawn Rake..... 35¢
 Gibbs' Hustler No. 0..... 35¢
 Gibbs' Hustler No. 1..... 35¢
 Oneida Lawn Rake..... 35¢

Razors-

Campbell Cutlery Co..... 50¢
 Electric Cutlery Co..... Net prices
 Galvanic..... Net prices
 Jordan's AAA, new list..... Net prices
 Jordan's Old Faithful, new list..... Net prices
 J. R. Torrey Razor Co..... Net prices
 Wostenholm and Butcher, 10 to 20¢

Razor Straps-

See Straps, Razor.

Reels, Clothes Line-

Stearns..... 35¢ 10¢

Registers-

Moore's Bronze Finishes..... 70¢
 Moore's Electroplated..... 75¢
 Moore's Japanned..... 75¢
 Moore's Solid Bronze..... 65¢
 Moore's Stove Pipe..... 35¢

Rings and Ringers-**Bull Rings-**

Ellrich Hdw. Co., White Metal, low list..... 50¢ 50¢ 10¢
 Hotchkiss' low list..... 30¢
 Humason, Beckley & Co.'s..... 70¢ 10¢
 Peck, Stow & W. Co.'s..... 50¢ 10¢ 50¢ 10¢ 10¢
 Sargent's..... 75¢ 10¢
 Union Nut Co..... 65¢

Hog Rings and Ringers

Blair's Hog Rings..... 1/75
 Blair's Hog Rings..... 40¢ 90¢ 1/10
 Brown's Rings..... 1/75
 Brown's Rings..... 1/75
 Champion Rings..... 1/75
 Champion Rings, Double..... 1/75
 Electric Hog Rings..... 1/75
 Electric Hog Rings..... 1/75
 Hill's Improved Rings..... 1/75
 Hill's Old Style Rings..... 1/75
 Hill's Rings..... 1/75
 Hill's Tongs..... 1/75
 Major Rings..... 1/75
 Major Rings..... 1/75
 Perfect Rings..... 1/75
 Perfect Rings..... 1/75
 Top of the Hill Rings..... 1/75
 Top of the Hill Rings..... 1/75

Rivets and Burrs-

Copper..... 60¢ 60¢ 10¢
 Coppered Iron, Betina Brand..... 50¢ 25¢
 Iron Norway, Ist Nov. 17 '87..... 40¢ 1/4
 Se Rty..... 70¢ 70¢ 5¢

Rivet Sets-See Sets.**Roasting and Baking Pans-See Pans, Roasting and Baking.****Rods-**

Star, Black Walnut..... 70¢ doz 40¢
 Star, Brass..... 25¢ 50¢

Rollers-

Acme Moore's Anti-Friction..... 55¢
 Barn Door, Sargent's list..... 60¢ 10¢ 10¢
 Moore's Barn Door Stay..... 50¢
 Union Barn Door Roller..... 70¢
 Thompson Mfg. Co.'s Lawn Rollers..... 30¢

Rope-The following prices are f.o.b.

New York or factory, and are shaded 1/4¢ on large lots; terms, 1 1/2% for cash.
 Manila, 7-16 in. diam. and larger..... 7 @ 7 1/4¢
 Manila, 3/4 in. and 5-16 in. 7 @ 7 1/4¢
 Manila, Tarred Rope, Med'm 7 @ 7 1/4¢
 Sisal, 7-16 in. and larger..... 5 @ 5 1/4¢
 Sisal, 3/4 in. and 5-16 in. 5 @ 5 1/4¢
 Sisal, Tarred Rope..... 4 @ 4 1/4¢
 Sisal, Medium Lath Yarn..... 4 @ 4 1/4¢
 New Zealand, 7-16 in. and larger..... 5 @ 5 1/4¢
 New Zealand, 3/4 inch..... 5 @ 5 1/4¢
 New Zealand, 1/2 and 5-16 in. 5 @ 5 1/4¢
 New Zealand, Hay Rope..... 4 @ 4 1/4¢
 New Zealand, Tarred Rope..... 4 @ 4 1/4¢
 Cotton Rope..... 12 @ 15¢
 Jute Rope..... 5 @ 5 1/4¢

Wire-

List February, 1892. All kinds, 50¢ 50¢ 55¢

Rules-

Boxwood..... 50¢ 10¢ 10¢ 80¢ 10¢ 10¢ 10¢
 Ivory..... 60¢ 10¢
 Starrett's Steel Rules and Straight Edges..... 25¢ 10¢

Sad Irons-See Irons, Sad.**Sand and Emery Paper and Cloth-**

See Paper and Cloth.

Sash Cord-See Cord, Sash.**Sash Locks-See Locks, Sash.****Sash Weights-**

See Weights, Sash.

Sausage Stuffers or Fillers-See Stuffers or Fillers, Sausage.**Saws-**

Note.-Extra 50¢ 10¢ often given.

Atkins' Circular..... 50¢ 10¢
 Atkins' Cross Cuts, new list..... 40¢
 Atkins' Circular Saw and Drag..... 50¢ 10¢
 Atkins' One-Man Saw..... 40¢
 Atkins' Wood Saws..... 40¢
 Diston's Circular..... 45¢ 10¢ 25¢
 Diston's Cross Cut, list Jan. 1, 1893..... 40¢ 10¢
 Diston's Hand..... 25¢
 O. E. Jennings & Co.'s..... 25¢
 Peace Circular and Mill..... 45¢ 10¢ 25¢
 Peace Cross Cuts, list Jan. 1, 1893..... 45¢ 10¢
 Peace Hand, Panel and Rip..... 25¢ 25¢ 25¢
 Richardson's Circular and Mill..... 45¢ 10¢ 25¢
 Richardson's X Cuts, list Jan. 1, 1893..... 45¢ 10¢
 Richardson's Hand..... 25¢ 25¢ 25¢
 Simonds' Circular Saws..... 45¢ 10¢ 25¢
 Simonds' Crescent Ground Cross Cuts..... 30¢
 Simonds' Gang, Mill, Mulay and Drag Saws..... 45¢ 10¢ 25¢
 Wheeler, Madden & Clemson Mfg. Co. Cross Cuts, list Jan. 1, 1893..... 45¢ 10¢
 Hand, Panel and Rip..... 30¢ 10¢
 Woodrough & McFarlin..... 45¢ 10¢
 Cross Cuts, list Jan. 1, 1893..... 45¢ 10¢
 Hand, Panel and Rip..... 25¢ 10¢

Hack Saws-

Eureka and Crescent..... 25¢
 Griffin's, complete..... 40¢ 10¢ 25¢
 Griffin's Hack Saw..... 40¢ 10¢ 25¢
 Star Hack Saws and Blades..... 25¢

Scroll-

Barnes' Builders' and Cab Makers'..... 45¢ 25¢
 Barnes' Scroll Saw Blades..... 35¢
 Lester, complete..... 10.00..... 25¢
 Rogers, complete..... 4.00..... 25¢

Saw Frames-

See Frames, Saw.

Saw Sets-See Sets, Saw.**Saw Tools-See Tools, Saw.****Scale Beams-**

See Beams, Scale.

Scales-

Chatillon's Eureka..... 25¢
 Chatillon's Favorite..... 40¢
 Chatillon's Grocers' Trip Scales..... 50¢
 Family, Turnbills..... 30¢ 30¢ 10¢
 Hatch, Counter, No. 171, good quality..... 1/75
 Hatch, Tea, No. 161..... 1/75
 Riehle Bros' Platform..... 40¢ 40¢ 10¢
 Union Platform, Plain..... 25¢ 10¢ 10¢
 Union Platform, Striped..... 25¢ 10¢ 10¢

Scissors, Fluting.

45¢

Scrapers-

Adjustable Box Scraper (S. R. & L. Co.)..... 40¢ 10¢
 Box, 1 Handle..... 20¢ 20¢ 10¢
 Box, 2 Handle..... 20¢ 20¢ 10¢
 Danforth Box and Ship..... 20¢ 10¢
 Ship, Common..... 50¢ 10¢ 25¢
 Ship, R. I. Tool Co..... 10¢

Screen Window and Door**Frames-See Frames****Screw Drivers-**

See Drivers, Screw

Screws-**Bench and Hand-**

Bench, Iron..... 55¢ 10¢ 55¢ 10¢ 10¢
 Bench, Wood, Beach..... 20¢ 25¢
 Bench, Wood, Hickory..... 20¢ 10¢
 Hand, Wood..... 25¢ 10¢ 25¢ 10¢ 25¢
 Hand, Grand Rapids, list..... 35¢
 Coach, Lag and Hand-Rail-
 Lag, Blunt Point, list Jan. 1, 1890..... 80¢ 10¢ 80¢ 25¢
 Coach and Lag, Gimlet Point, list Jan. 1, 1890..... 80¢ 10¢ 80¢ 20¢
 Hand Rail, Am. Screw Co..... 75¢
 Hand Rail, H. & B. Mfg Co..... 70¢ 10¢ 75¢
 Hand Rail, Sargent's..... 70¢ 10¢

Jack Screws-

Millers Falls..... 50¢ 10¢ 10¢
 Millers Falls, Roller..... 60¢ 10¢
 P. S. & W..... 35¢
 Sargent..... 70¢
 Stearns..... 40¢ 10¢

Cork-

Detroit Cork Screw Co..... 35¢
 Humason & Beckley Mfg. Co..... 40¢ 10¢ 50¢
 Williamson's..... 35¢ 35¢ 25¢
 Williamson's Forged Worm Applewood Handle, 70¢ doz., \$5.00; Rosewood, \$5.50..... 40¢

Machine-

Flat Head Iron..... 70¢
 Round Head Iron..... 65¢

Wood-

List January 1, 1891.....
 Flat Head Iron..... 80¢
 Round Head Iron..... 75¢
 Flat Head Brass..... 80¢
 Round Head Brass..... 75¢
 Flat Head Bronze..... 80¢
 Round Head, Bronze..... 75¢
 Rogers' Drive Screws..... 85¢ 10¢

Scroll Saws-See Saws, Scroll.**Scythes-**

Grain..... 40¢ 25¢ 40¢ 10¢
 Grass..... 40¢ 10¢ 50¢

Scythe Snaths-

See Snaths, Scythe.

Sets-**Awl and Tool-**

Alken's Sets, Awls and Tools.....
 No. 20, 70¢ 10.00..... 60¢ 60¢ 55¢
 Common Brad Sets.....
 No. 42, 10.00; No. 43, 12.50..... 70¢ 10¢ 55¢
 Fray's Ad. Tool Hds., Nos. 1, 112; 2, 118..... 3, 112; 4, 112..... 45¢
 Henry's Combination Haft..... 70¢ 50¢
 Millers Falls Ad. Tool Hds., No. 1, 112; No. 4, 112; No. 5, 118..... 25¢
 Stanley's Excelsior.....
 No. 1, 7.50; No. 2, 4.00; No. 3, 5.50..... 80¢ 10¢

Nail-

Round..... 70¢ gr. \$3.25
 Square..... 70¢ gr. \$4.00
 Buck Bros..... 27¢ 43¢
 Cannon's Diamond Point..... 70¢ gr. \$12.20

Rivet-

Regular list..... 70¢

Saw-

Atkin's Criterion..... 70¢ doz No. 1, \$3.00
 Atkin's Genuine..... 13.00, 50¢ 10¢ 60¢
 Atkin's Imitation..... 70¢ doz \$3.00 \$3.25
 Atkin's Lever..... 70¢ doz No. 1, \$6.00
 Avery's Saw Set and Punch..... 50¢
 Bemis & Call Co.'s Cross Cut..... 30¢ 25¢
 Bemis & Call Co.'s Plate..... 20¢
 Bemis & Call Spring Hammer..... 40¢ 20¢
 Crescent Lever..... 70¢ doz \$3.00
 Crescent..... 70¢ doz \$3.00
 Croissant (Keller), No. 1, 15.00; No. 2, 24.00..... 40¢ 10¢ 50¢
 Diston's Star..... 25¢
 Hammer, Bemis & Call Co.'s new Pat. 45¢
 Hammer, Hotchkiss..... 55¢ 50¢
 Hays Pat. Lever..... 70¢ doz \$12.00
 Kohler's Giant Royal..... 70¢ doz \$7.00
 Kohler's Royal..... 70¢ doz \$7.00
 Leach's, No. 0, \$8.00; No. 1, 15.00..... 15¢ 20¢
 Leopold..... 40¢ 10¢ 10¢
 Lloyd's Acme..... 70¢ doz \$16, 40¢ 10¢
 Morrill's No. 1, 15.00..... 40¢ 20¢
 No. 3 and 4 Cross Cut, 25.00..... 40¢ 20¢
 No. 5, Mill, \$31.00..... 40¢ 20¢
 No. 10, 15.00..... 40¢ 20¢
 No. 11, 15.00..... 40¢ 20¢
 Nash's..... 20¢ 10¢ 40¢
 Stillman's Genuine..... 70¢ doz \$5.00 70¢, 75¢
 Stillman's Pattern, Hand, 70¢ doz \$3.25
 Cross Cut, 65.00..... 55¢ 55¢ 10¢
 Taintor Positive..... 70¢ doz \$18, 50¢

Sharpeners, Knife-

Applewood Handles..... 70¢ doz \$8.00, 50¢
 Rosewood or Cocobola..... 70¢ doz \$9.00, 50¢
 Tanite Mills..... 70¢ gr. \$14.40..... 25¢ 35¢ 45¢

Shaves, Spoke-

Iron..... 45¢
 Wood..... 30¢
 Bailey's (Stanley R. & L. Co.)..... 60¢ 10¢
 Cincinnati..... 25¢ 10¢
 Goodell's..... 70¢ doz \$9.00..... 25¢
 Stearns..... 40¢ 10¢

Shears-

Acme Cast Shears..... 10¢ 10¢ 10¢ 10¢ 10¢
 American (Cast)..... 10¢ 10¢ 10¢ 10¢ 10¢
 American Lamp Trimmers..... 70¢ doz \$3.75
 Cast Steel Trimmers:
 First quality..... 80¢ 10¢ 80¢ 10¢ 10¢
 Second quality..... 50¢ 10¢ 50¢ 10¢ 10¢
 Campbell Cutlery Co., Jap'd..... 75¢
 Nickel Plated..... 65¢
 Claus brand, Japanned..... 60¢
 Claus brand, Nickel-plated..... 60¢
 Clipper..... 10¢ 10¢ 10¢ 10¢ 10¢
 Dayenport Cutlery Co..... 10¢ 10¢ 10¢
 Diamond Cast Shears..... 10¢ 10¢ 10¢
 Galvanic 3/4 to 9 in., 70¢ doz..... 40¢
 Hatch Cutlery Co. Solid Steel Forged..... 60¢ 60¢ 10¢
 Heinisch's, list Dec. 1881..... 60¢ 10¢ 10¢ 10¢ 10¢
 Heinisch's Tailor's Shears..... 55¢ 45¢
 Howe Bros. & Hulbert, Solid Forged Steel..... 40¢
 Seymour's, list Dec. 1881..... 60¢ 10¢ 10¢ 10¢ 10¢
 Victor Cast Shears..... 75¢ 10¢ 75¢ 10¢ 10¢

Tinners' Snips-

Cast Handles, List with Steel..... 40¢
 Niagara Snips, list Shears..... 20¢ 10¢
 Wrt. Handles, Steel Blades..... 20¢ 10¢

Pruning Shears and Hooks

Diston's Combined 'Pruning' Hook and Saw..... 70¢ doz \$18.00, 20¢ 10¢
 Diston's Pruning Hook, 70¢ doz \$12.00, 20¢ 10¢
 Dunlap's Saw and Chisel, 70¢ doz \$8.50, 50¢
 Henry's Pruning Shears, 70¢ doz \$4.25, 20¢ 10¢
 E. S. Lee & Co.'s Pruning Tools..... 50¢ 10¢ 70¢
 Levin Pruner No. 1, 15.00..... 40¢ 25¢
 Levin Pruner No. 2, 32.00..... 40¢ 25¢
 J. Mallinson & Co., No. 1, 25.25; No. 2, 27.25
 Pruning Shears, Henry's Pat..... 35¢ 50¢ 40¢
 P. S. & W. Co..... 50¢ 50¢ 60¢
 Wheeler, M. & C. Co., Combination..... 70¢ 12.00

Tinners', &c.-

Shears and Snips (P. S. & W.)..... 20¢ 25¢
 Snips, J. Mallinson & Co..... 35¢ 25¢

Sheaves-Sliding Door-

Corbin's list..... 60¢ 10¢ 25¢
 M. W. Co., list July, 1888..... 50¢ 10¢ 60¢ 25¢
 Moore's Anti-Friction..... 50¢
 Patent Roller..... 60¢ 10¢ 25¢
 Patent Roller, Hatfield's..... 75¢
 R. & E., list Dec. 18, 1885..... 55¢ 20¢
 Russell's Anti-Friction, list Dec. 18, 1885..... 60¢ 25¢

Sliding Shuttle-

Reading list..... 60¢ 10¢ 10¢
 R. & E., list Dec. 18, 1885..... 60¢ 10¢ 25¢
 Sargent's list..... 70¢

Shells-

Brass Shot Shells, Club, Rival, Climax..... 65¢ 25¢
 Brass Shot Shells, list quality..... 60¢ 25¢
 First quality 3, 8, 10 and 12 gauge..... 25¢ 10¢ 25¢
 First quality Rival, Club and Climax brands, 14, 16 and 20 gauge (\$7.50 list)..... 20¢ 10¢ 25¢
 Prize..... 40¢ 25¢
 Smokeless brand, 12, 10, 16 gauge..... 35¢ 10¢ 25¢
 Star, Club, Rival and Climax Brands..... 35¢ 10¢ 25¢
 Trap brand, 12 and 10 gauge..... 35¢ 10¢ 25¢

Shells, Loaded-

Standard list, July 19, 1890..... 40¢ 10¢ 10¢ 40¢ 10¢ 10¢ 10¢ 10¢
 25¢ cash, 10¢ days.

Ship Tools-

L. & J. White..... 20¢ 25¢

Shoes, Horse, Mule, &c.-**Horse**

Burden's, Perkins, Phoenix, Standard, Diamond State, Bryden's Bone and Crescent..... \$3.50 to \$4.00
 Bryden's Frog Pressure, at factory..... \$5.00

Mule-

Add \$1 keg to above prices.

Ox Wrought-

Ton lots..... 70¢ 90¢
 1000 lb lots..... 70¢ 90¢
 500 lb lots..... 70¢ 90¢

Shot-

Drop, up to B, 25-b bag..... \$1.15
 Drop, up to B, 25-b bag..... 35¢
 Drop, B and larger, 25-b bag..... 1.40
 Drop, B and larger, 5-b bag..... .40
 Bag and Chilled, 25-b..... 1.40
 Bag and Chilled, 5-b bag..... 2.00
 Dust Shot, 25-b bag..... 2.00
 Dust Shot 5-b bag..... .45

Snaps, Harness, &c.
Anchor 1, & S. sig. Co. 50¢
Andrews 50¢
Cover's Saddle Works Triumph 35¢
Covered Spring 60¢
Cover 50¢
Cover Patent 50¢
Cover, New R. E. 50¢
Fitch's (Boston) 40¢
German, New Hat 40¢
Hotchkiss 10¢
Kelley & Woolworth's Steel Harness 50¢
John Prots Snaps 75¢
Sargent's Patent Guarded 75¢

Snaths
Scythe 50¢

Soldering Irons
See Irons, Soldering.

Spittoons, Cuspidors, &c.
Standard Fibreware
Cuspidors, 4 1/2 inch, No. 5, 8; No. 5, 8, 9.
Spittoons, Daisy, 8-inch, No. 1, 10 and 11 inch, 8.

Spoke Shaves
See Shaves, Spoke.

Spoke Trimmers
See Trimmers, Spoke.

Spoons and Forks
Tinned Iron

Basting, Cen. Stamp. Co.'s list 70¢
Buffalo, S. S. & Co. 35¢
Solid Table and Tea, Cen. Stamp. Co.'s list 70¢

Silver Plated
4 months or 5¢ each 30 days:

L. Boardman & Son 50¢
Holmes & Edwards Silver Co. 40¢
Meriden Brit. Co., Rogers 40¢
Reed & Barton 40¢
Rogers & Bros 40¢
O. Rogers & Bros 40¢
Rogers & Hamilton 40¢
Wm. Rogers Mfg. Co. 40¢
Simpson, Hall, Miller & Co. 40¢

Miscellaneous
Boardman's Britannia Spoons, case lots 60¢

Boardman's Nickel Silver, list July 1, 1891 60¢
Britannia 60¢
German Silver 60¢
Nickel Silver 60¢
Holmes & Edwards Silver Co. 60¢
No. 24 German Silver 60¢
No. 30 Silver Metal 60¢
No. 49 Nickel Silver 60¢
No. 49 Nickel Silver 60¢
No. 97 Mexican Silver 60¢
Rogers & Hamilton 60¢
Cimetar, Flatware 40¢
Cimetar, Steel Goods 40¢
Crown Hamilton, Flatware and Cutlery 30¢
Steel Goods 40¢
Wm. Rogers Mfg. Co. 60¢
18¢ Rogers' German Silver 60¢
22¢ Rogers' Nickel Silver 60¢
Rogers' Silver Metal 60¢

Springs, Door
Champion (coll.) 60¢
Cowell's, No. 1, 10¢; No. 2, 15¢
Gem (coll.), list April 19, 1888 20¢
Exterciles 60¢
Phenix 60¢
Rubber, complete, 10¢
Star (coll.), list April 19, 1888 20¢
Torrey's Rod, 39 in. 10¢
Warner's No. 1, 10¢; No. 2, 15¢
Victor (coll.) 60¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Squares
Nickel-Plated 30¢
Steel and Iron 30¢

Carriage, Wagon, &c.
Elliptic, Concord, Platform and Half Scroll 60¢

Sprinklers, Lawn
Gibbs' Arc 12¢
Gibbs' Hustler 12¢

Oil Stones, &c.
Pike Mfg. Co.
Hindostan No. 1, 1/2 doz. 8¢
Sand Stone 5¢
Turkey Oil Stone, 4 to 8 40¢
in 10¢
Turkey Slips 20¢
Lily White Washita 80¢
Rosy Red Washita 80¢
Washita Stone, Extra 80¢
Washita Stone, No. 1 80¢
Lily White Slips 80¢
Rosy Red Slips 80¢
Washita Slips, Extra 80¢
Washita Slips, No. 1 80¢
Arkansas Stone, No. 1, 5 to 8 50¢
Arkansas Stone, No. 1 5 to 8 50¢

Lake Superior
Lake Superior Slips 20¢
Tanite Mills 20¢
Emery Oil 50¢

Stops, Bench
Cincinnati 25¢
Rescent 25¢
Hotchkiss 25¢
McGills 25¢
Morrill's 25¢
Morrill's 25¢
Stearns' 25¢
Terrell's Nos. 1 and 2, 2 doz. 25¢
Weston's No. 1, 10 No. 2, 25¢

Stove Polish
See Polish, Stove.

Stretchers Carpet
Cast Iron, Steel Points 75¢
Cast Steel, Polished 75¢
Socks 75¢
Bullard's 75¢

Strops Razor
Badger's Belt and Com. 20¢
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Genuine Emerson 60¢
Imitation 60¢
Jordan's Pat. Padded, list Nov. 1, 89 50¢
Lamont Combination 40¢
Torrey's 40¢

Stuffer Sausage
Miles' Challenge, 10¢
Perry 10¢
Draw Cut No. 4, each 30¢
Enterprise Mfg. Co., list Jan 17, '93 25¢
Silver's 40¢

Sweepers, Carpet and Lawn
Acme 20¢
Advance 20¢
Banner Jap'd, 20¢
Bissell No. 5 20¢
Bissell No. 8 20¢
Bissell, Grand 20¢
Crown Jewel, No. 1, 10¢; No. 2, 15¢
Domestic 20¢
Domestic, No. 2 20¢
Easy Jap'd, 20¢
Excelsior 20¢
Gilt Edge 20¢
Grand Rapids 20¢
Grand Republic 20¢
Jap'd, 20¢
Housewife's Delight 20¢
Imperial 20¢
Improved Parlor Queen 20¢
Nicked 20¢
Ladies' Friend 20¢
Ladies' Friend No. 2 20¢
Magie 20¢
Model 20¢
Phlor Queen 20¢
Our Leader 20¢
Our Own 20¢
Rapid Jap'd, 20¢
Reliable 20¢
Standard 20¢
Supreme 20¢
The Star 20¢
Triumph 20¢
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates
5 dozen in 6 months 20¢
10 dozen in 6 months 20¢
Except on L.F. when 10 dozen price is \$18.50, and 25 dozen \$18.00.

Swings
Davies Lawn 25¢

Tacks, Brads &c.
List October 19, 1888. Old established straight weights. Short Weight goods sold at lower prices.

Carpet Tacks
American, Blue 47¢
American, Tin'd and Cop'd 47¢
Steel, Bright and Blue 47¢
Steel, Tinned and Coppered 47¢
Swedes Iron, S. S., Blue 47¢
Swedes Iron, S. S., Tinned 47¢
American Iron Tacks, Domestic 37¢
American Iron Tacks, Foreign 50¢
Swedes Iron Tacks 37¢
S. S., Blue 37¢
S. S., Tinned 37¢
Lanc. Blue 37¢
Lanc. Tinned 37¢
Upholsterers' S. S. 37¢
Upholsterers' Lanc. 37¢
Gimp Tacks 30¢
S. S., Blue 30¢
S. S., Tinned 30¢
Lanc. Blue 30¢
Lanc. Tinned 30¢
Basket and Trimmers Tacks 30¢
Lanc. 30¢
S. S. 30¢
Hungarian Nails 35¢
Common and Patent Brads 35¢
Leathered Tacks 65¢
Brush Tacks and Nails, S. S. 5¢
Looke's Glass Tacks, S. S. 5¢
Picture-Frame Points, S. S. 12¢
Lace Tacks Blue 12¢
Lace Tacks, Tinned 20¢
Finishing Nails 52¢
Trunk and Clout Nails 52¢
Black 52¢
Tinned or Coppered 52¢
Basket Nails 37¢
Chair Nails 35¢
Ogier Box Nails 30¢
Tin Capped Nails 60¢

Strops Razor
Badger's Belt and Com. 20¢
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Genuine Emerson 60¢
Imitation 60¢
Jordan's Pat. Padded, list Nov. 1, 89 50¢
Lamont Combination 40¢
Torrey's 40¢

Stuffer Sausage
Miles' Challenge, 10¢
Perry 10¢
Draw Cut No. 4, each 30¢
Enterprise Mfg. Co., list Jan 17, '93 25¢
Silver's 40¢

Sweepers, Carpet and Lawn
Acme 20¢
Advance 20¢
Banner Jap'd, 20¢
Bissell No. 5 20¢
Bissell No. 8 20¢
Bissell, Grand 20¢
Crown Jewel, No. 1, 10¢; No. 2, 15¢
Domestic 20¢
Domestic, No. 2 20¢
Easy Jap'd, 20¢
Excelsior 20¢
Gilt Edge 20¢
Grand Rapids 20¢
Grand Republic 20¢
Jap'd, 20¢
Housewife's Delight 20¢
Imperial 20¢
Improved Parlor Queen 20¢
Nicked 20¢
Ladies' Friend 20¢
Ladies' Friend No. 2 20¢
Magie 20¢
Model 20¢
Phlor Queen 20¢
Our Leader 20¢
Our Own 20¢
Rapid Jap'd, 20¢
Reliable 20¢
Standard 20¢
Supreme 20¢
The Star 20¢
Triumph 20¢
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates
5 dozen in 6 months 20¢
10 dozen in 6 months 20¢
Except on L.F. when 10 dozen price is \$18.50, and 25 dozen \$18.00.

Swings
Davies Lawn 25¢

Tacks, Brads &c.
List October 19, 1888. Old established straight weights. Short Weight goods sold at lower prices.

Carpet Tacks
American, Blue 47¢
American, Tin'd and Cop'd 47¢
Steel, Bright and Blue 47¢
Steel, Tinned and Coppered 47¢
Swedes Iron, S. S., Blue 47¢
Swedes Iron, S. S., Tinned 47¢
American Iron Tacks, Domestic 37¢
American Iron Tacks, Foreign 50¢
Swedes Iron Tacks 37¢
S. S., Blue 37¢
S. S., Tinned 37¢
Lanc. Blue 37¢
Lanc. Tinned 37¢
Upholsterers' S. S. 37¢
Upholsterers' Lanc. 37¢
Gimp Tacks 30¢
S. S., Blue 30¢
S. S., Tinned 30¢
Lanc. Blue 30¢
Lanc. Tinned 30¢
Basket and Trimmers Tacks 30¢
Lanc. 30¢
S. S. 30¢
Hungarian Nails 35¢
Common and Patent Brads 35¢
Leathered Tacks 65¢
Brush Tacks and Nails, S. S. 5¢
Looke's Glass Tacks, S. S. 5¢
Picture-Frame Points, S. S. 12¢
Lace Tacks Blue 12¢
Lace Tacks, Tinned 20¢
Finishing Nails 52¢
Trunk and Clout Nails 52¢
Black 52¢
Tinned or Coppered 52¢
Basket Nails 37¢
Chair Nails 35¢
Ogier Box Nails 30¢
Tin Capped Nails 60¢

Strops Razor
Badger's Belt and Com. 20¢
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Genuine Emerson 60¢
Imitation 60¢
Jordan's Pat. Padded, list Nov. 1, 89 50¢
Lamont Combination 40¢
Torrey's 40¢

Stuffer Sausage
Miles' Challenge, 10¢
Perry 10¢
Draw Cut No. 4, each 30¢
Enterprise Mfg. Co., list Jan 17, '93 25¢
Silver's 40¢

Sweepers, Carpet and Lawn
Acme 20¢
Advance 20¢
Banner Jap'd, 20¢
Bissell No. 5 20¢
Bissell No. 8 20¢
Bissell, Grand 20¢
Crown Jewel, No. 1, 10¢; No. 2, 15¢
Domestic 20¢
Domestic, No. 2 20¢
Easy Jap'd, 20¢
Excelsior 20¢
Gilt Edge 20¢
Grand Rapids 20¢
Grand Republic 20¢
Jap'd, 20¢
Housewife's Delight 20¢
Imperial 20¢
Improved Parlor Queen 20¢
Nicked 20¢
Ladies' Friend 20¢
Ladies' Friend No. 2 20¢
Magie 20¢
Model 20¢
Phlor Queen 20¢
Our Leader 20¢
Our Own 20¢
Rapid Jap'd, 20¢
Reliable 20¢
Standard 20¢
Supreme 20¢
The Star 20¢
Triumph 20¢
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates
5 dozen in 6 months 20¢
10 dozen in 6 months 20¢
Except on L.F. when 10 dozen price is \$18.50, and 25 dozen \$18.00.

Swings
Davies Lawn 25¢

Tacks, Brads &c.
List October 19, 1888. Old established straight weights. Short Weight goods sold at lower prices.

Carpet Tacks
American, Blue 47¢
American, Tin'd and Cop'd 47¢
Steel, Bright and Blue 47¢
Steel, Tinned and Coppered 47¢
Swedes Iron, S. S., Blue 47¢
Swedes Iron, S. S., Tinned 47¢
American Iron Tacks, Domestic 37¢
American Iron Tacks, Foreign 50¢
Swedes Iron Tacks 37¢
S. S., Blue 37¢
S. S., Tinned 37¢
Lanc. Blue 37¢
Lanc. Tinned 37¢
Upholsterers' S. S. 37¢
Upholsterers' Lanc. 37¢
Gimp Tacks 30¢
S. S., Blue 30¢
S. S., Tinned 30¢
Lanc. Blue 30¢
Lanc. Tinned 30¢
Basket and Trimmers Tacks 30¢
Lanc. 30¢
S. S. 30¢
Hungarian Nails 35¢
Common and Patent Brads 35¢
Leathered Tacks 65¢
Brush Tacks and Nails, S. S. 5¢
Looke's Glass Tacks, S. S. 5¢
Picture-Frame Points, S. S. 12¢
Lace Tacks Blue 12¢
Lace Tacks, Tinned 20¢
Finishing Nails 52¢
Trunk and Clout Nails 52¢
Black 52¢
Tinned or Coppered 52¢
Basket Nails 37¢
Chair Nails 35¢
Ogier Box Nails 30¢
Tin Capped Nails 60¢

Strops Razor
Badger's Belt and Com. 20¢
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Genuine Emerson 60¢
Imitation 60¢
Jordan's Pat. Padded, list Nov. 1, 89 50¢
Lamont Combination 40¢
Torrey's 40¢

Stuffer Sausage
Miles' Challenge, 10¢
Perry 10¢
Draw Cut No. 4, each 30¢
Enterprise Mfg. Co., list Jan 17, '93 25¢
Silver's 40¢

Sweepers, Carpet and Lawn
Acme 20¢
Advance 20¢
Banner Jap'd, 20¢
Bissell No. 5 20¢
Bissell No. 8 20¢
Bissell, Grand 20¢
Crown Jewel, No. 1, 10¢; No. 2, 15¢
Domestic 20¢
Domestic, No. 2 20¢
Easy Jap'd, 20¢
Excelsior 20¢
Gilt Edge 20¢
Grand Rapids 20¢
Grand Republic 20¢
Jap'd, 20¢
Housewife's Delight 20¢
Imperial 20¢
Improved Parlor Queen 20¢
Nicked 20¢
Ladies' Friend 20¢
Ladies' Friend No. 2 20¢
Magie 20¢
Model 20¢
Phlor Queen 20¢
Our Leader 20¢
Our Own 20¢
Rapid Jap'd, 20¢
Reliable 20¢
Standard 20¢
Supreme 20¢
The Star 20¢
Triumph 20¢
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates
5 dozen in 6 months 20¢
10 dozen in 6 months 20¢
Except on L.F. when 10 dozen price is \$18.50, and 25 dozen \$18.00.

Swings
Davies Lawn 25¢

Tacks, Brads &c.
List October 19, 1888. Old established straight weights. Short Weight goods sold at lower prices.

Carpet Tacks
American, Blue 47¢
American, Tin'd and Cop'd 47¢
Steel, Bright and Blue 47¢
Steel, Tinned and Coppered 47¢
Swedes Iron, S. S., Blue 47¢
Swedes Iron, S. S., Tinned 47¢
American Iron Tacks, Domestic 37¢
American Iron Tacks, Foreign 50¢
Swedes Iron Tacks 37¢
S. S., Blue 37¢
S. S., Tinned 37¢
Lanc. Blue 37¢
Lanc. Tinned 37¢
Upholsterers' S. S. 37¢
Upholsterers' Lanc. 37¢
Gimp Tacks 30¢
S. S., Blue 30¢
S. S., Tinned 30¢
Lanc. Blue 30¢
Lanc. Tinned 30¢
Basket and Trimmers Tacks 30¢
Lanc. 30¢
S. S. 30¢
Hungarian Nails 35¢
Common and Patent Brads 35¢
Leathered Tacks 65¢
Brush Tacks and Nails, S. S. 5¢
Looke's Glass Tacks, S. S. 5¢
Picture-Frame Points, S. S. 12¢
Lace Tacks Blue 12¢
Lace Tacks, Tinned 20¢
Finishing Nails 52¢
Trunk and Clout Nails 52¢
Black 52¢
Tinned or Coppered 52¢
Basket Nails 37¢
Chair Nails 35¢
Ogier Box Nails 30¢
Tin Capped Nails 60¢

Strops Razor
Badger's Belt and Com. 20¢
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Genuine Emerson 60¢
Imitation 60¢
Jordan's Pat. Padded, list Nov. 1, 89 50¢
Lamont Combination 40¢
Torrey's 40¢

Stuffer Sausage
Miles' Challenge, 10¢
Perry 10¢
Draw Cut No. 4, each 30¢
Enterprise Mfg. Co., list Jan 17, '93 25¢
Silver's 40¢

Sweepers, Carpet and Lawn
Acme 20¢
Advance 20¢
Banner Jap'd, 20¢
Bissell No. 5 20¢
Bissell No. 8 20¢
Bissell, Grand 20¢
Crown Jewel, No. 1, 10¢; No. 2, 15¢
Domestic 20¢
Domestic, No. 2 20¢
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Excelsior 20¢
Gilt Edge 20¢
Grand Rapids 20¢
Grand Republic 20¢
Jap'd, 20¢
Housewife's Delight 20¢
Imperial 20¢
Improved Parlor Queen 20¢
Nicked 20¢
Ladies' Friend 20¢
Ladies' Friend No. 2 20¢
Magie 20¢
Model 20¢
Phlor Queen 20¢
Our Leader 20¢
Our Own 20¢
Rapid Jap'd, 20¢
Reliable 20¢
Standard 20¢
Supreme 20¢
The Star 20¢
Triumph 20¢
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates
5 dozen in 6 months 20¢
10 dozen in 6 months 20¢
Except on L.F. when 10 dozen price is \$18.50, and 25 dozen \$18.00.

Swings
Davies Lawn 25¢

Tacks, Brads &c.
List October 19, 1888. Old established straight weights. Short Weight goods sold at lower prices.

Carpet Tacks
American, Blue 47¢
American, Tin'd and Cop'd 47¢
Steel, Bright and Blue 47¢
Steel, Tinned and Coppered 47¢
Swedes Iron, S. S., Blue 47¢
Swedes Iron, S. S., Tinned 47¢
American Iron Tacks, Domestic 37¢
American Iron Tacks, Foreign 50¢
Swedes Iron Tacks 37¢
S. S., Blue 37¢
S. S., Tinned 37¢
Lanc. Blue 37¢
Lanc. Tinned 37¢
Upholsterers' S. S. 37¢
Upholsterers' Lanc. 37¢
Gimp Tacks 30¢
S. S., Blue 30¢
S. S., Tinned 30¢
Lanc. Blue 30¢
Lanc. Tinned 30¢
Basket and Trimmers Tacks 30¢
Lanc. 30¢
S. S. 30¢
Hungarian Nails 35¢
Common and Patent Brads 35¢
Leathered Tacks 65¢
Brush Tacks and Nails, S. S. 5¢
Looke's Glass Tacks, S. S. 5¢
Picture-Frame Points, S. S. 12¢
Lace Tacks Blue 12¢
Lace Tacks, Tinned 20¢
Finishing Nails 52¢
Trunk and Clout Nails 52¢
Black 52¢
Tinned or Coppered 52¢
Basket Nails 37¢
Chair Nails 35¢
Ogier Box Nails 30¢
Tin Capped Nails 60¢

Strops Razor
Badger's Belt and Com. 20¢
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Genuine Emerson 60¢
Imitation 60¢
Jordan's Pat. Padded, list Nov. 1, 89 50¢
Lamont Combination 40¢
Torrey's 40¢

Stuffer Sausage
Miles' Challenge, 10¢
Perry 10¢
Draw Cut No. 4, each 30¢
Enterprise Mfg. Co., list Jan 17, '93 25¢
Silver's 40¢

Sweepers, Carpet and Lawn
Acme 20¢
Advance 20¢
Banner Jap'd, 20¢
Bissell No. 5 20¢
Bissell No. 8 20¢
Bissell, Grand 20¢
Crown Jewel, No. 1, 10¢; No. 2, 15¢
Domestic 20¢
Domestic, No. 2 20¢
Easy Jap'd, 20¢
Excelsior 20¢
Gilt Edge 20¢
Grand Rapids 20¢
Grand Republic 20¢
Jap'd, 20¢
Housewife's Delight 20¢
Imperial 20¢
Improved Parlor Queen 20¢
Nicked 20¢
Ladies' Friend 20¢
Ladies' Friend No. 2 20¢
Magie 20¢
Model 20¢
Phlor Queen 20¢
Our Leader 20¢
Our Own 20¢
Rapid Jap'd, 20¢
Reliable 20¢
Standard 20¢
Supreme 20¢
The Star 20¢
Triumph 20¢
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates
5 dozen in 6 months 20¢
10 dozen in 6 months 20¢
Except on L.F. when 10 dozen price is \$18.50, and 25 dozen \$18.00.

Swings
Davies Lawn 25¢

Tacks, Brads &c.
List October 19, 1888. Old established straight weights. Short Weight goods sold at lower prices.

Whips

American Whip Co.: Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.....	15.00	16.50	18.00	20.00				
Bull Bone, Half-length Whalebone.....			11.00	12.00	13.00	15.00		
American Standard.....	8.00	8.50	9.00	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center.....	6.00	6.00	6.50	7.00	7.50	8.00		
New Name, Stoked Java, Black and Wine Colors.....				6.00				
America, 98 Pen Whip.....				6.00				
Gents' Light Driving No. 111.....				6.00				
Gents' Light Driving No. 106.....				6.00				
Hand-made Stoked Java No. 108.....			8.75	4.00				
A large variety of cheaper grades.....								50¢@83.00
Team Whips.....								\$2.00@37.50
Toy Whips.....								\$3.50@12.00
Hardware Assortment, 10/American, 75 Whips for \$50.00.								

Wire and Wire Goods—**Iron—**

Market,

Br. & Ann., Nos. 0 to 18.....	Extra 5¢@10¢
75¢@10¢@10¢@10¢	often given
Cop'd, Nos. 0 to 18, 75¢@5¢	and low net
Galv., Nos. 0 to 18.....	prices often
70¢@70¢@10¢	made on
Tin'd, Tin'd list, Nos. 0 to 18.....	large lots.
70¢@70¢@10¢	

Stone, Br. and Ann'd.....	
Nos. 16 to 18.....	80¢
Nos. 19 to 23.....	30¢@5¢
Nos. 27 to 36.....	32¢@25¢
Ann. Steel Wire on Spools.....	60¢
Brass, list Jan. 18, 1894.....	40¢@5¢
Cast Steel Wire.....	40¢@5¢
Copper, list Jan. 18, 1894.....	40¢@5¢
Galvanized Fence.....	75¢@10¢
Malin's An'led & Tin'd on Spools.....	50¢@5¢
Malin's Brass and Cop. on Spools.....	50¢@5¢

Steel Music Wire, 12 to 30, imported.....	60¢@70¢
Stubs' Steel Wire.....	\$6.00 to 2, 30¢
Tate's Spooled, Tin'd & Annealed.....	60¢@5¢
Tate's Spooled, Cop. and Brass.....	60¢
Tinned Broom Wire, 18 to 23, # B.....	4¢@5¢
Wire Cloth, Line, and Lard.....	
Wire Picture Cord, see Cord.....	

Bright Wire Goods—

Standard list.....	90¢@92¢@15¢
Wire Cloth and Netting—	
Galvanized Wire Netting.....	80¢@80¢@10¢@5¢
Painted Screen Cloth 100 ft.....	\$1.45@1.50

Wire Barb—

See Trade Report.

Wire Rope—See Rope, Wire.**Wrenches—**

American Adjustable.....	40¢
Baxter's Adjustable "8".....	40¢@10¢@50¢
Baxter's Diagonal.....	60¢
Coe's Genuine.....	50¢@50¢@10¢
Coe's "Mechanics".....	50¢@10¢@5¢
Girard Standard.....	65¢@10¢@70¢
Lamson & Sessions' Engineer.....	60¢@5¢
Lamson & Sessions' Standard.....	70¢@10¢
Girard Agricultural.....	
Lamson & Sessions' Agric'l.....	75¢@1¢@5¢
P. S. & W. Agricultural.....	80¢@5¢
W. & B. Diamond.....	
Acme, Bright.....	50¢@5¢
Acme, Nicked.....	40¢@5¢

Aiken's Pocket (Bright).....	\$6.00, 50¢@10¢
Alligator.....	80¢
Always Ready.....	25¢@5¢
Bent's & Co.'s.....	
Adjustable S.....	35¢@5¢
Brigg's Pattern.....	80¢@10¢
Combination Black.....	40¢@10¢
Combination Bright.....	40¢@5¢
Cylinder or Gas Pipe.....	45¢@5¢
Extra Heavy.....	45¢
Merrick's Pattern.....	55¢
No. 8 Pipe Bright.....	55¢
Bit Wrench, Adj., Tatum's.....	\$2.25, 25¢@10¢

Boardman's.....	80¢
Cincinnati Brace Wrenches.....	25¢@10¢
Diamond Steel.....	55¢@5¢
Donohue's Engineer.....	20¢@10¢
Eagle.....	70¢@70¢@10¢
Hercules.....	55¢@10¢@5¢
Taft's Vise Wrench.....	\$4.00, 40¢
The Favorite Pocket.....	\$4.00, 40¢
Walker's.....	55¢@5¢
Webster's Pat. Combination.....	25¢

Wringers, Clothes

Am. Winger Co.'s list, July 1, 1893.....	2¢ cash
Colby Winger Co.'s list, Sept. 1, '91.....	2¢ cash
Lovell Mfg. Co., list July 1, 1892.....	2¢ cash
Peerless Mfg. Co., list Feb. 1, 1892.....	2¢ cash
National Winger & Mfg. Co., list June 1, 1892.....	2¢ cash

Wrought Goods

Staples, Hooks, &c., list, March 17, 1893.....	85¢@10¢@35¢ & 15
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Paints, Oils and Colors.—Wholesale Prices.**Animal and Vegetable Oils—**

Linseed, City, raw, per gal.....	52 @ ..
Linseed, City, boiled.....	55 @ ..
Linseed, Western, raw.....	50 @ ..
Lard, City, Extra Winter.....	64 @ 64
Lard, City, Prime.....	63 @ 63
Lard, City, Extra No. 1.....	62 @ 62
Lard, City, No. 1.....	61 @ 61
Lard, Western, prime.....	63 @ ..
Cotton-seed, Crude, prime.....	30 @ ..
Cotton-seed, Crude, off grades.....	28 @ 28
Cotton-seed, Summer Yellow, prime.....	33 @ 34
Cotton-seed, Summer Yellow, off grades.....	31 @ 32
Sperm, Crude.....	63 @ 63
Sperm, Natural Spring.....	68 @ 68
Sperm, Bleached Spring.....	68 @ 70
Sperm, Natural Winter.....	68 @ 70
Sperm, Bleached Winter.....	73 @ 75
Whale, Crude.....	44 @ ..
Whale, Natural Winter.....	44 @ ..
Whale, Bleached Winter.....	47 @ ..
Whale, Extra Bleached.....	49 @ ..
Sea Elephant, Bleached Winter.....	20 @ ..
Menhaden, Crude, Sound.....	20 @ ..
Menhaden, Crude, Southern.....	25 @ 30
Menhaden, Light Pressed.....	34 @ 30
Menhaden, Bleached Water.....	38 @ 39
Menhaden, Extra Bleached.....	40 @ 41
Tallow, City, prime.....	45 @ 45
Tallow, Western, prime.....	43 @ 47
Cocconut, Ceylon.....	54¢@ 54¢
Cocconut, Cochila.....	64¢@ 64¢
Cod, Domestic.....	38 @ 40
Cod, Foreign.....	40 @ 43
Red Elaine.....	35 @ 38
Red Saponified.....	44¢@ 44¢
Bank.....	35 @ 35
Straits.....	36 @ 36
Olive, Italian, bbls.....	58 @ 62
Neatsfoot, prime.....	60 @ 65
Palm, prime, Lagos.....	54¢@ 54¢

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test.....	7 @ 7 1/2
Black, 29 gravity, 15 cold test.....	7 @ 8
Black, 29 gravity, summer.....	54¢@ 64¢

Cylinder light, filtered.....	12 @ 16
Cylinder, dark, filtered.....	10 @ 13
Paraffine, 23 1/2 @ 24 gravity.....	11 @ 12
Paraffine, 25 gravity.....	10 @ 11
Paraffine, 28 gravity.....	7 1/2 @ 8
Paraffine, red.....	9 1/2 @ 10 1/2

Paints and Colors—

Barytes, Foreign, 10 ton.....	\$22.00
Barytes, Amer. doated.....	\$22.00
Barytes, Amer. No. 1.....	\$18.00
Barytes, Amer. No. 2.....	\$15.00
Barytes, Amer. No. 3.....	\$11.00
Blue, Celestial.....	\$ 8 @ 8
Blue, Chinese.....	40 @ 50
Blue, Prussian.....	25 @ 40
Blue, Ultramarine.....	8 @ 25
Brown, Spanish.....	14¢@ 1
Brown, Vandyke, Amer.....	3 @ 3 1/2
Brown, Vandyke, English.....	6 @ 8
Carmine, No. 40, in bulk.....	2 00 @ ..
Carmine, No. 40, in boxes or barrels.....	2.10 @ ..
Carmine, No. 40, in ounce bottles.....	3.00 @ ..
Chalk, in bulk.....	1.75 @ 2.00
Chalk, in bbls.....	33 @ 40
China Clay, English.....	13.00 @ 18.00
Cobalt Oxide, prep'd.....	9.00 @ 11.00
Cobalt Oxide, black.....	
lots 100 lb.....	1.90 @ ..
less 100 lb.....	1.86 @ ..
Green, Paris, in bulk.....	20 @ 20
Green, Paris, 170 @ 175 lb.....	20 1/2 @ 20 1/2
Green, Paris, small pack.....	22 @ 26 1/2
Rebates.....	3¢ @ 3¢ on lots of 10,000 lb or over; 2¢ @ 2¢ on 4000 to 10,000 lb; 2¢ @ 2¢ on 2000 to 4000 lb; 1¢ @ 1¢ on 1000 to 2000 lb; 1¢ @ 1¢ on 500 to 1000 lb purchased during the season.
Blue, Chrome, ordinary.....	6 @ 12
Green, Chrome, pure.....	22 @ 25
Lead, Eng., B.B. white.....	7 @ 8
Lead, Amn. White.....	
Dry.....	4 1/2 @ 4 1/2
In Oil.....	5 1/2 @ 6 1/2
Lead, White, in oil, 25 lb tin pails, add to keg price.....	.. @ ..
Lead, White, in oil, 12 1/2 lb tin pails, add to keg price.....	.. @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.....	.. @ 2 1/2

Lead, Red, bbls. and 1/2 bbls.....	5 1/2 @ 5 1/2
Lead, Red, kegs.....	5 1/2 @ 6
Litharge, kegs.....	5 1/2 @ 5 1/2
Litharge, bbls. and 1/2 bbls.....	5 1/2 @ 6
Ocher, Rochelle.....	1.35 @ 1 1/2
Ocher, French Washed.....	1 1/2 @ 1 1/2
Ocher, American.....	1 1/2 @ 1 1/2
Orange Mineral, English.....	7 1/2 @ 8
Orange Mineral, French.....	10 @ 10 1/2
Orange Mineral, German.....	7 1/2 @ 8
Orange Mineral, American.....	7 1/2 @ 8
Red, Indian, English.....	5 @ 15
Red, Indian, American.....	2 @ 5
Red, Turkey.....	9 @ 14
Red, Tuscan.....	7 @ 10
Red, Venetian, American.....	7 @ 10
Red, Venetian, English.....	1.10 @ 1.00
Sienna, Italian, Burnt and Pow'd.....	4 @ 5
Sienna, Ital., Burnt Lumps.....	1 1/2 @ 3 1/2
Sienna, Ital., Raw, Pow'd.....	4 1/2 @ 5 1/2
Sienna, Ital., Raw, Lumps.....	1 1/2 @ 3 1/2
Sienna, American, Raw.....	1 1/2 @ 1 1/2
Sienna, American, Burnt and Powdered.....	1 1/2 @ 1 1/2
Talc, French.....	1 1/2 @ 1 1/2
Talc, American.....	1 @ 1 1/2
Terra Alba, Fr'ch.....	65 @ 75
Terra Alba, English.....	65 @ 75
Terra Alba, American No. 1.....	65 @ 75
Terra Alba, American No. 2.....	45 @ 60
Umber, Turkey, Burnt and Powdered.....	2 1/2 @ 3 1/2
Umber, Turkey Bnt. Ln.....	2 1/2 @ 3
Umber, Turkey, Raw and Powdered.....	2 1/2 @ 3 1/2
Umber, Turkey, R'w Lumps.....	2 1/2 @ 2 1/2
Umber, Turkey, Bnt. Amer.....	1 1/2 @ 1 1/2
Umber, Turkey, R'w Amer.....	1 1/2 @ 1 1/2
Yellow, Chrome.....	10 @ 20
Vermilion, Quicks'er, bulk.....	11 @ 12
Vermilion, Quicks'er, bags.....	43 @ ..
Vermilion, Quicksilver sm'r pks.....	52 @ 60
Vermilion, English Import.....	55 @ 60
Vermilion, Imitation, Eng.....	8 @ 30
Vermilion, Trieste.....	90 @ 95
Vermilion, Chinese.....	85 @ 1.00
Whiting Common.....	40 @ 45
Whiting Gliders.....	50 @ 55
Zinc, American, dry.....	8 1/2 @ 4 1/2
Zinc, French, Red Seal.....	7 @ 7 1/2

Zinc, French, Green Seal.....	8 1/2 @ 9
Zinc, French, V. M. X.....	6 @ 7
Zinc, Antwerp, Red Seal.....	6 @ 6 1/2
Zinc, Antwerp, Green Seal.....	6 1/2 @ 7 1/2
Zinc, German, L. Z. O.....	5 @ 5 1/2
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10 1/2 @ ..
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over.....	9 1/2 @ ..
lots of less than 1 ton.....	10 1/2 @ ..
Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1¢; 25 bbls., 2¢; 50 bbls., 3¢. No discount allowed on less than bbl. lots.	

Colors in Oil—

Black, Drop, Frankfurt.....	25 @ 30
Black, Drop, English.....	12 @ 15
Black, Drop, Domestic.....	7 @ 10
Black, Lampblack, Best.....	20 @ 35
Black, Lampblack, Common.....	7 @ 13
Black, Ivory.....	8 @ 15
Blue, Chinese.....	35 @ 40
Blue, Prussian.....	20 @ 45
Blue, Ultramarine.....	12 @ 18
Brown, Vandyke.....	7 @ 12
Green, Chrome.....	8 @ 13
Green, Paris.....	16 @ 18 1/2
Sienna, Raw.....	7 @ 14
Sienna, Burnt.....	7 @ 14
Umber, Raw.....	7 @ 10
Umber, Burnt.....	7 @ 10

Putty—

In barrels and 1/2 bbls.....	.013¢ @ .013¢
In tubs.....	.013¢ @ .013¢
In tin cans.....	.013¢ @ .024¢
In bladders.....	.013¢ @ .024¢

Spirits Turpentine—

In regular bbls.....	@ 80
In machine bbls.....	@ 30 1/2

Glue—

Low Grade.....	7 @ 9
Cabinet.....	11 @ 14
Medium White.....	12 @ 14
Extra White.....	16 @ 20
French.....	10 @ 22
English.....	10 @ 15
Irish.....	10 @ 12 1/2

THE IRON AGE.

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Copper

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